THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XVIII No. 428—21st YEAR.] LONDON, MARCH 16, 1869. [Subscription per Ann. 15s. in Advance 18s. Credit.] DOUBLE No. Price 1s.

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9746 cubic feet of gas per ton of coal.
26-candle gas.
13½ cwt. coke per ton of coal.
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These Meters are warranted to measure correctly and not to vary, and have come into general use more rapidly than any Meters hitherto manufactured.

PARIS EXHIBITION, 1867.
THE TESTING-HOUSE REPORTS.
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Ports of Shipment, in the Firth of Forth.

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The Proprietors will, in future, use their own forms of bills of lading, and also issue certificates of origin, signed, as the case may be, either by JAMES FERGUSON & Co., or by the NITSHILL & LESMAHAGO COAL COMPANY; and they request all consumers purchasing Lesmahago Coal to demand such a certificate for each cargo, and to observe that it corresponds with the bill of lading.
Auchinheath, Lesmahago, March, 1868.

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WITH CHAMBERS FOR MOUTHS,

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The Directors of the Alliance Gas Company have kindly consented to give every facility to gentlemen desirous of seeing the invention in operation. Parties, therefore, about to visit Dublin will be so good as to send us their card, and we will furnish them with letters of introduction.

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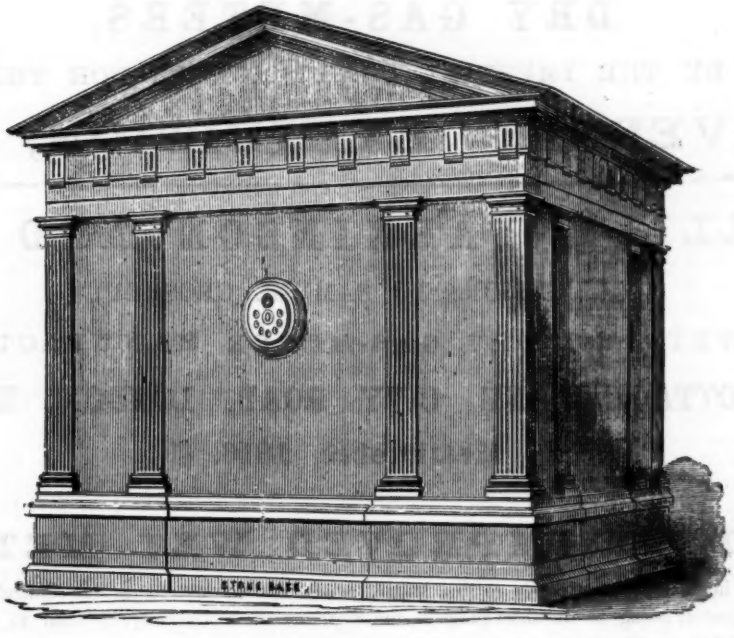

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All sizes of CONSUMERS METERS generally in Stock.

STATION-METERS, in round or square cases, on the Shortest Notice.

THE

UNIVERSAL EXHIBITION OF PARIS,

1867.

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DRY GAS-METERS,

BY THE IMPERIAL COMMISSIONERS FOR THE

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(SUCCESSORS TO SAMUEL CROSLEY),

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Established 1816.

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"It is well known that n Meters constructed so that the valve will close when the water is drawn off to such a point as to render them 3 per cent. slow the lights are liable to be extinguished by the closing of the valve by a sudden increase of pressure. To meet this difficulty, Mr. Pinchbeck has invented an ingenious and simple arrangement by which the action is reversed, and any such increase of pressure, in his Meter, raises the value instead of depressing it. The fact of the improvement having been adopted by Messrs. W. Parkinson and Co. is a sufficient guarantee that it practically and effectually remedies the inconvenience it is designed to meet."—JOURNAL OF GAS LIGHTING.

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TEST GASHOLDERS, EXPERIMENTAL METERS, EXHAUSTER REGULATORS,

MINUTE CLOCKS, PRESSURE GAUGES, PHOTOMETERS, PRESSURE REGISTERS, &c.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

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This JOURNAL has been duly registered at the General Post-Office for transmission abroad.

The next number will be published on Tuesday, March 30, and the subsequent numbers on each successive alternate Tuesday.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All communications for the Editor to be addressed, "No. 42, Parliament Street, Westminster;" and all remittances for subscriptions or orders for advertisements to the Publisher, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MARCH 16, 1869.

Notes upon Passing Events.

MR. JOHN BRIGHT has already reformed the traditions of the Board of Trade, by speaking his mind very freely and very plainly on questions which, according to official precedent, would have been the texts of homilies intentionally obscure. Humbug and cant have no mercy at the hands of the right honourable gentleman, and quacks will soon find that they do not improve their positions in the eyes of the world by making long-winded speeches *at*, or asking silly questions *of*, the President of the Board of Trade. The first example was made of that well-known bore and parliamentary failure, Mr. T. Dyke Acland, who, having received a good deal more education than his intellect was able to bear, and having, about a quarter of a century ago, achieved a double first class at Oxford, has ever since been trying, without any success, to take up a distinguished position in literature and in Parliament. Mr. Acland's grievance, or rather the grievance of the clients he professed to represent, lies in a very small compass. The Cattle Plague sent the farmers in unusual numbers up to the Government departments, sometimes to the Home Office, sometimes to the Board of Trade, and sometimes to the Privy Council Office. Wherever they went—and it was always two to one that they went to the wrong place—they were never received by any official who could sympathize with the feelings of stock-breeders and graziers. They met several barristers, two or three colonels of engineers, many trained civil servants, and, as heads of departments, noble and aristocratic landowners. Except in the case of Mr. Caird—and he, being a Scotchman, was an exception to all ordinary rules—there is no instance of an agriculturist, not being one of the landed gentry, ever having been promoted to an official position. The farmers simply want that at the Board of Trade, instead of being referred to a colonel of engineers, when they go up on a Cattle Plague or any other agricultural question, they shall be referred to some Englishman of the same calibre as Mr. Caird, or Mr. Clare Sewell Reade, the Norfolk farmer. A very short and simple speech would have explained this, and ensured attention by the fairness of the demand, if urged in a plain way. But such a form of operation did not suit Mr. Acland, who saw in his motion an opportunity of exhibiting himself to the world "in a statesmanlike and exhaustive speech," and succeeded in making himself supremely ridiculous before a thoroughly wearied House. He sketched the position of a Minister of Agriculture, with duties so multifarious that no one but the orator could fill the post. Without a single cheer to relieve the dreary proceeding, Mr. Acland prosed away, suggesting, for the consideration of the proposed Minister, the law of holding and the tenure of land—the obstacles to the investment of capital in land—the means of preventing silly landowners from taxing their property for imperfect drainage—the collection of information on agricultural subjects and agricultural statistics—the selection by public competition of persons to superintend the sanitary arrangements of villages—the promotion of cottage-building for agricultural labourers—the promotion of roads and railroads in forlorn and forgotten nooks of the country—the superintendence of county bridges—the regulation of the internal cattle trade—the management of the river basins, with a view to the drainage, irrigation, sewage, and water supply of towns—the settlement of the tenant-right question—and he concluded by suggesting the creation of a Minister of Health and Agriculture (Mr. Edwin Chadwick's idea), to be endowed out of the funds now absorbed by the Enclosure Commissioners. In a word, there was no possible agricultural subject that he did not "meddle and muddle" with, in language so obscure that it requires translating to be understood, except—as Mr. Bright remarked, amid much laughter and loud cheers—the game laws! Farmers, who, as a rule, are extremely ignorant of the constitutions and laws of foreign countries, may be excused for imitating the frogs of old, who called for a king, and asking for a Minister of Agriculture. If they only knew what it meant, they would follow Mr. Bright's advice, "and come as little as possible to any Government office." If they want to be lectured, advised, and ordered by such a person as Mr. Ac-

land on the way in which they should cultivate, drain, and irrigate their land—if they want his system of irrigation forced upon them—if they desire to have his authority in collecting statistics—if they desire to become schoolboys, with a sort of schoolmaster over them—then let them petition for a Minister of Agriculture. In those continental countries in which the Minister of Agriculture exists, there are neither county members of Parliament nor county papers. The agriculturists, chiefly ignorant peasants, are supposed to be incapable of thinking for themselves, and therefore a Minister of State looks after their interest for them. If our farmers will only choose and use county M.P.'s judiciously, they will carry the reforms they need without putting themselves into the leading-strings of amateurs of the Acland type.

Mr. Bright's reply to Mr. Selwin-Ibbetson's reproduction of the stereotyped misrepresentation of railway management—dealing with more important questions than Mr. Acland's platitudes—was still a more remarkable example of the healthy tone now prevailing at the Board of Trade. He concluded a masterly summary of the statistics of railway accidents by saying:—

> My own belief is that, owing so much as we do to them, and considering their vast expenditure of capital, with the service they render to the public, we might, on many occasions, take a fairer view of the conduct and the success of railway management than we are accustomed to do in this country. The honourable member asked, further, whether the Government would not grant a Select Committee "to inquire as to the best method of regulating such traffic, either by the establishment of a separate line for the conveyance of goods, or by a compulsory system of telegraphic signals." I think the honourable member can hardly suppose that it would be possible for a committee to recommend, or for Parliament to insist on, the formation of separate lines for the conveyance of goods. As the lines become more and more crowded, in some circumstances it is possible that recourse may be had to other lines. The London and North-Western Company have, for some miles, another line out of London; and that example may, perhaps, be followed elsewhere. But when you consider the difficulty which many of these companies are now under in regard to capital, I think it would be throwing away the time and labour of a committee to ask it to investigate a question like that. With respect to a compulsory system of telegraphic signals, these signals are, I think, universal on the lines; they are, as far as I understand, very complete; and if the Board of Trade or any Act of Parliament were to interfere with a matter so delicate and minute in the management and arrangements of railways as that, I think that in all probability it would do ten times more harm than good. I hope, then, that the statement I have made may not only be deemed a sufficient answer to the question of the honourable gentleman, but may do something to allay the fears which have been created among those who have not examined the facts, and which, no doubt, give a shock to the nerves of many persons who travel by railway. For myself, I agree very much with those connected with railways when they say that there is no place in which a man can put himself where he can remain so long and go so far without taking any harm as in a first-class railway carriage.

These are weighty words, and, coming from one of the enormous personal influence of the right honourable gentleman, are likely to check the vehemence with which a certain school of Radical writers are in the habit of calling for the aid of an official Jupiter on the slightest provocation.

It seems from the discussion which arose the other night, on a motion of Lord Edward Cecil's for inquiring into the best modes of checking the use of false weights and measures, that we are waiting for the report of a commission on standard weights and measures. When it is settled what are true weights and measures, it will be as easy as it is urgent to make the process for detecting and punishing intentional robbers amongst retail tradesmen short, sharp, and decisive. The present process is simply ridiculous. The persons who appoint the inspectors in the metropolitan districts are not unfrequently in the trades who practise and profit by fraudulent weights and measures. The form and ceremony with which inspections are conducted, generally give ample notice to the defrauders to conceal the offending articles, and, when detection has taken place, the utmost fine inflicted will be amply recouped in one brisk Saturday night's trade. It must be remembered that the greatest offenders are to be found amongst those who deal for ready money with the weekly wages class, and often with the poorest of the poor. Inspection of weights and measures should never be parochial. A few persons would easily do the work of the whole metropolis if their visits were unexpected, and if it were left to the magistrate inflicting the fine to decide whether the case was so evidently intentional or flagrantly careless as to deserve publication in the local papers, and by placards printed at the expense of the criminal, which rival tradesmen would willingly exhibit. Experience has proved that fraudulent tradesmen do not care for fines, but are in mortal terror of publicity. It is mere special pleading to object that some weights and measures are against the tradesman. Such cases are as rare as first-class passengers in second-class carriages, and as little deserving of punishment.

Another hot debate has taken place on Lord Robert Montagu's Contagious Cattle Diseases Bill, and it has been thrown out. Pity that so important a measure is not in better hands. There is, however, nothing to prevent a majority, if it exists, from carrying a clause in the Government Bill, for establishing water-side markets for foreign cattle. The theory of Mr. Forster's Bill looks sound enough at first sight, but it is sure to break down in working. He assumes that health is the normal state of continental cattle. He therefore proposes to allow them to be imported freely, until disease is reported in any foreign country; then he sanctions very stringent measures for isolating the suspected animals, and stamping out the disease. The obvious objection to this course is that the cattle plague is always simmering in the eastern steppes of Europe; that the greater the demand in England, the greater the temptation to export from the Russian, and Polish, and other pastures; that foreign officials have no interest in intercepting an infected or suspicious cargo; that inspection on our own shores is, at best, a very hasty and imperfect precaution; and that, finally, foreign cattle markets cannot be improvised. Create a trade for them, and they will be built, but they will not be built on the speculation of an Order in Council to call them into profitable use. The metropolis is more interested in this question than any other English port. Now, it is well known that the Corporation of London, having the monopoly of a live meat market, will not set up a foreign cattle market in opposition to the one they have built at Camden Hill—if they can help it. They will promise fairly, but they fully understand the use of delay. If, as it ought to be, the speculation were in the hands of private individuals, a market or markets would be built cheaply enough; good drainage and sufficient fencing would be the principal items. But it does not suit the Corporation to do anything cheaply. Vast solid erections employ a great many tradesmen, and experienced corporators know how money may be made to filter through many channels, until it reaches their nearest and dearest friends, without the least trace of a vulgar job. No Yankee is ever so silly as to steal, says Sam Slick; he makes more by an acute advantage. The experienced corporator does not job, but he bestows patronage where it will be gratefully remembered and returned in the safest and most indirect manner. The only formidable enemy of a foreign cattle market is the Corporation of London.

The *Times* has thought the reform of the turf, by the exclusion of two-year-old or baby horses from severe trials and races, of sufficient importance, in the middle of the parliamentary session, to give Admiral Rous more than a column to himself, and bestow a leader on the admiral's opinions. The propagation and increase of sound useful horses is really a matter of national importance, but whatever racing may have done, it certainly does nothing now but harm to the breed of riding and driving horses. A racehorse is a machine for gambling as much as a pack of cards or a roulette-box. A horse may be extremely swift over the smooth ground and short distances on which races are run, and yet of a shape and action most undesirable for either riding or driving; in fact, some of the most famous racehorses have been in shape more like greyhounds than the *beau idéal* of a beautiful horse. But, beside the winners of the great races, which, however symmetrical, exercise no influence on the breed of horses for ordinary use, because their fee as stallions exceeds the average price of a marketable saddle or harness horse, there are a number of racehorses bred every year which, at two or three years old, being worthless for the turf or any other purpose, are made fat and turned into cheap stallions. With bad feet, bad action, narrow, and in every respect the opposite of what a horse ought to be, on the strength of handsome head and tail, and relationship by sire or grandsire to some famous winner, these brutes travel the country to procreate other brutes equally ill-shaped and unsound. This is an increasing evil. More gambling facilities are every year required, and more miserable brutes are bred to supply the demand. To check the evil, Sir Joseph Hawley, an old hand who has "often "been in the oven," proposes that the Jockey Club should set the fashion, by the example of discouraging two-year-old races. Admiral Rous is not a gambler himself, but he is the great god of the Ephesians of the racecourse—a vain old man, to whom the gross flattery of the professional swindlers of the turf is as the breath of his nostrils—so he throws the weight of his opinion against any reform, on the principle that "every fellow has a right to wallop his own donkey." Some

wise people wish to correct the evil by establishing one or two great stakes for horses that have never run until three or four years old—an absurdity, because such stakes are insignificant: a hundred thousand has been won on one race. Others propose to encourage good sires by offering prizes of £100 at agricultural shows for first-class stallions—a waste of funds, considering that the horses that win such prizes are altogether beyond the reach of the breeder of hacks, hunters, or harness horses. We cannot check gambling on the turf, but do not let us cant about the value of the modern racehorse as an instrument for anything but winning and losing money. When a thoroughbred stallion is of perfect form, and is also a great winner, he is out of the reach of breeders; when he is a brute only fit for carrion, he is sold for twenty pounds, and his services are supplied at a pound or two. If the impossible event which Admiral Rous dreads were to take place, and, racing being abolished, the price of stallions came down from five thousand to five hundred pounds, it would be greatly for the benefit of the nation. But even in the East a fine Arab stallion is worth a thousand pounds.

"London Water Supply Facts and Fallacies Discussed." Under this title Mr. Taylor, C.E., has republished in a pamphlet a series of letters he addressed to an evening journal, which will be very useful for reference on this important subject. Mr. Taylor, beside giving the benefit of his own experience, fortifies his arguments with telling extracts from papers by such authorities as Dr. Letheby and Mr. Bailey Denton. His exposure of the fallacy of the favourite soap-test of the engineer of the Loch Katrine works is complete. According to this theory, the Glaswegians save forty thousand pounds a year in soap alone by their soft water; but it is pertinently asked, does any tax-paying inhabitant of that famous city really find that he saves an appreciable part of his income by the change? The saving is supposed to be one-tenth of the soap. Seven shillings a year is a fair estimate of the soap consumption of an individual of average cleanliness. Thus London, by abandoning all the water-works which have cost millions, and date back two centuries, would have the chance of saving eightpence halfpenny a head—*in theory*. Washerwomen, who know of cheaper articles than soap, might discover the difference, but would scarcely allow it to their customers. We need not argue any longer on the advantages of going to Cumberland or to Wales for a new water supply of theoretical purity. The drought of last summer, which upset all the calculations of the great model Lancashire water-works, settled that question. Mr. Taylor presses the importance of economizing the resources of the upper valley of the Thames, now wasted in floods and often wanted in droughts. "The "area draining to the river down to Hampton, where five "water companies take their supply, is about 3700 square "miles—less than half an inch of rain out of 26 inches. The "average rainfall running off this area produces all the water "at present supplied to London by those companies—viz., "about 60 million gallons a day. . . The waste in floods "is prodigious. In November, 1852, the river rose 10 feet "above its summer level at Kingston, and for many consecu-"tive days the quantity of water passing over Teddington "weir was above 8000 million gallons per day!" Mr. Taylor devotes a good deal of space to arguments against constant supply, which are true as far as they go. The difficulties of constant supply are great, and the disadvantages are inevitable; but, nevertheless, to argue against it is a waste of time. You might just as well dwell on the inconvenience of railway construction, or the danger and nuisance of gas lighting. The public will have constant supply, and the sooner the officials of water companies cease rowing against the stream of public opinion the better for the interests of their clients and shareholders. We quite agree with Mr. Taylor; indeed, we have more than once pointed out that, in poor neighbourhoods, a constant supply stand-pipe for a certain number of houses will answer better than a supply to each house. The saving from waste alone would pay the wages of a turncock in charge for so many hours per day. The great consumption of water in London is within six consecutive hours.

The advocate of the purchase of Irish railways by the Government will find a new difficulty in the tragedy at Mullingar. The station-master had occasion to discharge some railway porters who had fallen into the generous habit of helping their friends into carriages without the ceremony of taking tickets. For this crime he was denounced, it is said, by a priest from the altar; at any rate, he was shot dead, and the assassin enjoys the sympathy of a large section of the town population—such is the custom of the country. If Government becomes the proprietor of Irish railways, will it be possible to dismiss any popular favourite?

If Lord Redesdale, the legitimate successor of Lord Eldon in political theories, reads the debates of the Lower House, how he must shudder with indignation. Here are Mr. Corry and Sir John Pakington running races with the present Ministers in navy and army reductions. Mr. Graves, the member for Liverpool, is a Conservative, but when Mr. Samuda, with a natural eye to the main chance, put in a plea for retaining Woolwich as a ship-building port, Mr. Graves pointed out that big modern ships could get neither into nor out of Woolwich, and expressed a hope that Sheerness would also soon be discontinued! Mr. Childers, most fortunate of colonists and pensioners, has made a good beginning in the destructive part of his plan, and is also about to give fair play to turret ships, in spite of Mr. Reed. Perhaps that is enough for one session, but we want to hear that he will also provide a dozen large frigates of the swiftest character, armed with a few heavy guns, and able to give a good account of any Alabamas that may be launched against us in a future war. Defensive warfare has been brought very nearly to perfection, but the country is not in a proper position until we have a sufficient number of ships that can fight, or fly, or pursue, as occasion may require—swift under canvas and swift under steam. Lord Garlies, a captain in the Blues, made a very creditable maiden speech against Mr. Cardwell's army reforms, and in defence of the very magnificent and perfectly useless brigade to which he is attached. He was almost comic in his pathetic appeal to Mr. Cardwell to spare the household cavalry, which it is well known are perfectly useless as cavalry, although very ornamental. They act, on rare occasions, as a sort of mounted police. All their duty is done by the non-commissioned officers. It was only the other day that a lieutenant in the Blues was master of a pack of fox-hounds, which he hunted himself on a three months leave. He retired from his claims to represent his native county, at the mature age of twenty-two, because a very ugly customer of the same politics disputed the seat, and endangered his party. All field officers of cavalry who have served in actual war are agreed that, except as sinecures and ornaments of pageants, the two regiments of Life Guards and the regiment of Horse Guards Blue are of no value in a military point of view. The men and horses are both too big for a campaign; the officers have no qualifications except courage and horsemanship. Mr. Cardwell may effect a serious economy, increase the efficiency of our cavalry, and please all the army except the set represented by the Guards Club, if he will suppress the household cavalry altogether, and replace it, as we have before suggested, by the same number of regiments of heavy cavalry, to take their turn of duty with other regiments in this kingdom and India. To perform the proper part in the pageants of royalty, let a band be retained, and the gentlemen-at-arms, who now, with their magnificent colonel's uniform, wear helmets and spurs, be mounted on a hundred splendid chargers. It would not be very expensive, for, as the horses need do nothing but parade work, they ought to last at least seven years. The London barracks might still be retained, as they are capital schools of horsemanship. It is ridiculous that three regiments of our very limited cavalry should be so organized as to be dangerous only to servant-maids. The Greys and Enniskillens have proved themselves just as effective in keeping a mob in order. Altogether, in a practical sense, the session of Parliament opens well, and looks like real business.

Circular to Gas Companies.

The statesmanlike conduct of the President of the Board of Trade, in refusing to harass the metropolitan gas companies by further opposition until the Board have some definite proposition of their own to bring forward for regulating the gas supply of the metropolis, has excited the ire of the rampant agitators, who have joined in a chorus of vituperation against him. Foremost among them is Mr. Dresser Rogers, who, in a letter to the *Star*, laments that the unfortunate gas consumers of the metropolis, "who are allowed to exist for the purpose of raising rates and taxes," are to continue to pay for bad gas double the price that is paid by their more fortunate brethren for good gas in the country, because, as he insinuates, Mr. Bright has been listening to the "honied sentences" of

Mr. Baxter, and that the poor consumers will probably have "to wait out in the cold" until the advent of a Conservative Government, from whose fears more may be obtained than from the strong government of the Liberals. The *Daily News* joins in the lamentation that Mr. Bright should have left the consumers of gas to the mercy of the "monopolists," who, it is contended, ought to be "harassed" into supplying better gas at a lower price; and that, at least, advantage should be taken of the opportunity, when the Imperial and the South Metropolitan companies are applying to Parliament for additional powers, to coerce them to accept the same terms that were forced on the Chartered Company in the last session. The *Observer* also has an article in the old strain about "the "gigantic oppression, not to say robbery," of the metropolitan gas companies, and recommending a return to competition. The writer seems to have had recourse to the *répertoir* of the stereotyped eloquence in the vestries of former years, before the advantages of the districting arrangement were generally admitted; and he asserts, in direct opposition to well-known fact, that there has been no reduction in the price nor any improvement in the quality of the gas since the Metropolis Gas Act in 1860. In order to account for the superior quality of the gas, as represented in various authorized testings, it is alleged that the gas companies, by some underground practice of legerdemain, supply a different kind of gas to the testing-places from that supplied to the consumers. In the abuse of the gas companies and of Mr. Bright, Mr. Ayrton also comes in for his share, for having asserted, in the House of Commons, that the vestries have the remedy in their own hands for any malfeasance practised by the companies. But, like the waggoner in the fable, who, instead of putting his shoulder to the wheel to raise his waggon out of the ditch, idly called on Hercules for help, the vestries, instead of availing themselves of the provisions in the Act for their protection, idly call on the Government to aid them. The failures that have hitherto occurred in attempting to put those provisions in operation have been owing to the bungling manner of the proceedings, and are no proof of the insufficiency of the Metropolis Gas Act to afford the public all the protection required. It is fortunate for the gas consumers of the metropolis, as well as for the gas companies, that such supplications for help are made to a Government that is sufficiently strong to resist senseless importunities, and which will not "harass the gas companies" for the sake of a little popularity, when there is no practical advantage to be gained.

The Corporation of the City of London, after nearly six months gestation, presented the public, on Thursday last, with a gas examiner, in the person of Mr. C. Heisch, F.C.S., and lecturer on chemistry at the Middlesex Hospital; Dr. Whitmore, the other candidate, finding that the voting was going decidedly against him, resigned before the close of the poll, when the numbers were—for Mr. Heisch, 98; for Dr. Whitmore, 46. The examiner would have to enter immediately on his duties, which have been discharged during the long delay that has occurred in making the appointment by Mr. Fewtrell. The Metropolitan Board of Works have been more successful than could have been expected in obtaining candidates for the appointment of examiner of the Chartered Company's gas in the district supplied by them outside the City. Twelve gentlemen, some of them being of established reputation, have applied for the office, and Friday next is the day fixed for the election. It is lamentable to find that the miserable pittance of £100 per annum for testing the gas personally eight times a day—or little more than one shilling an hour for the time occupied—should be sought for by men qualified to undertake such important duties. But even that sum was grudged by some members of the Board, who wanted to evade making any appointment, as a communication had been received from the President of the Board of Trade, to the effect that it is not intended by the Government to proceed with a Bill for regulating the metropolis gas supply this session. The chairman, however, insisted on it as compulsory, and the matter was referred to the Gas Committee, who will examine the candidates personally; and they will have to pass through a similar ordeal before the general meeting of the Board on Friday.

The Corporation of Glasgow have set an example worthy of imitation by all municipal bodies who are desirous of acquiring the works of gas companies. They have offered to give the two companies which now supply gas to that city 9 per cent. annuities for their original 10 per cent. shares, and 6¾ per cent. for their new shares, bearing 7½ per cent. interest; the annuities to be secured on the rateable property of the city, or to be redeemable, as may be agreed. There are at present four Bills before Parliament relating to the gas supply of Glasgow, two of them being promoted by the existing companies, who apply for additional powers, and two by the Corporation, to empower them to supply gas—one of those Bills having for its object the construction of new works, and the other to authorize the purchase of the undertakings of the two companies; but, if the offer of the Corporation be accepted—of which there can be little doubt—the three first-named Bills will be abandoned. The meeting of the Town Council at which it was resolved to make the offer to the gas companies was held on the 2nd inst., when it appeared from the minutes of the Gas Committee that they had obtained a report from Mr. Barlow, in which three systems were indicated by which the price of gas might be reduced, and the quality permanently improved. The first was to purchase the undertakings of the companies; the second, to obtain power to erect new works if it were found impracticable to purchase; and the third, to endeavour to effect an amalgamation of the two companies, and to assign to each of their works a separate district. Conditionally on the acceptance by the companies of 9 and 6¾ per cent. annuities for their original and their new shares respectively, it was estimated in the report that the Corporation might be able to supply 30-candle gas at 3s. 10d. per 1000 feet, without meter-rents (of course, without profit), and Mr. Barlow recommended the offer of annuities at those rates. In the event of not entering into an agreement with the companies, he estimated that new works might be erected for the supply of one-third of the present consumption of Glasgow on terms that might enable the Corporation to supply 30-candle gas for 3s. 6d. per 1000 feet, without meter-rents; or that, by adopting the third plan of amalgamation, the companies might be able to supply 30-candle gas at 4s. per 1000 feet, without meter-rents, and realize profits sufficient to pay the prescribed dividends on their shares. The Lord Provost, on moving the adoption of the first of these three propositions for the purchase of the undertakings on the terms named, observed that though 9 per cent. might appear to be a high rate, it should be borne in mind that there had been expended on the works a considerable amount derived from the premiums on the shares sold, on which no dividends were payable. An amendment was proposed, to the effect that the Bill for authorizing the erection of new works should be proceeded with, instead of purchasing the existing gas undertakings, but it was lost by a very large majority. A subsequent amendment, for reducing the offer to the gas companies to 8 and 6 per cent., was also lost, but by a smaller majority, the numbers being 15 for the amendment, and 21 for the original motion, which was then carried.

Some members of the Gateshead Town Council have been endeavouring to induce the Corporation of that borough to adopt the opposite course to that wisely taken by the Corporation of Glasgow, and threaten to involve them in serious trouble. A special Gas Committee was appointed in November last, to inquire into the advisability of constructing new gas-works to compete in the supply of gas with the Newcastle and Gateshead Company, who alone possess statutory powers to lay gas-mains in the district. The committee, having obtained the opinions of two engineers favourable to such a scheme, reported that there would be no difficulty in finding a suitable site, nor in erecting the works to manufacture and supply gas, but that it would be necessary to obtain the sanction of Parliament; in the meantime, however, the committee recommended the Town Council to authorize them to purchase a site for the works, at a cost not exceeding £1500. The Town Council were not prepared to expend such a sum in preparation for works that might never be constructed, and the proposition was altered so as to restrict the committee to negotiate for, but not to secure, a suitable site. The resolution so modified was only carried by the casting vote of the deputy-mayor, and it is to be again brought forward for reconsideration.

Mr. Woollett, the chief promoter of the Aldrington and Brighton Gas Company, having failed to raise the necessary funds to carry out that project, has been trying to induce the Brighton Town Council to take it up, nominally for the supply of the public lamps, but really to compete with the two existing companies. At the meeting of the council, on the 3rd inst., Mr. Woollett, in supporting his resolution, asserted that notwithstanding the price of gas had been reduced 30 per cent., the cost of public lighting was nearly as great as before

the reduction; but he at the same time afforded an explanation of the anomaly, by admitting that many more lamps had been lighted, and that there was extra lighting for public rooms. Nor was he more happy in his advocacy of the plan of manufacturing gas for the supply of public lights only, when he adduced, as an illustration of its advantages, the profits made by the Corporation of Manchester from supplying all consumers of gas. The Town Council were proof against such arguments, and refused to be led into the useless expenditure of £90,000 to carry out Mr. Woollett's crotchets.

The Bill introduced by the Government for the valuation of property in the metropolis should be watched by the metropolitan gas companies, especially the third schedule, relating to the deductions to be made from the gross value of railways, canals, docks, tolls, water-works, and gas-works. It is proposed that the amount of such deductions shall be determined by the committee on the Bill.

Another instance of the "risks and casualties" to which gas companies are subjected in carrying on their business, was presented at the trial of a case at the recent Dorsetshire Assizes, where the Weymouth Gas Consumers Company had to defend an action brought against them for damage caused by explosions of gas. The plaintiff is a baker and confectioner in the town, and on the 28th of August an explosion occurred in his house, from which he suffered personal injury. The men sent by the company to repair the pipe from which the gas had escaped were alleged to have been intoxicated, and that they did the work in so negligent a manner that the gas escaped faster than before, and caused a second explosion on the following day, which killed a woman in the shop, and greatly damaged the premises, for which injuries the plaintiff sought to recover £2000. The jury gave a verdict in his favour, subject to a reference to assess the amount of the actual damage. The assessor is a gentleman who has hitherto disputed the claims of gas companies for any allowances for risks and casualties; but it is to be hoped that the further experience which this case will afford him may change his views on the subject. We may mention, as an instance of our own recent experience of the liability to accidents, even when all proper precautions have apparently been taken, that two experienced and careful workmen, in changing a meter, failed to make the connexions sufficiently strong to resist the strain of turning a stiff tap to let on the gas, and a severance was occasioned, from which the gas escaped rapidly. The smell of gas fortunately led to the discovery of the leakage, otherwise a damaging explosion might have taken place, the cause of which it would have been difficult to explain. The notice of this occurrence may serve as an additional caution to the men employed in changing meters.

The Brighton and Hove Gas Company have been compelled to withdraw the Bill promoted by them for the purchase of additional land at Aldrington, for the erection of new works, in consequence of a technical informality in their notices, which enabled the proprietor of adjacent land to oppose them successfully on Standing Orders. The committee would only allow the company to proceed with the Bill on the condition of their striking out those parts which gave them power to work residual products on their new site, and as the acquiring of that power was the chief object of promoting the Bill, it was thought better to withdraw it altogether.

The *finale* of the City of Moscow Gas Company has at length arrived. That disastrous concern, after struggling very hard for existence, is about to be wound up, and the original shareholders, who paid £625,000 in full confidence of realizing large dividends on their shares, will probably not receive a single penny of it back again. It was not a bubble speculation. The list of shareholders who subscribed and paid their money contains the names of many men of substantial wealth, and of sound reputation in the City as clever business men, some of whom have staked as much as £100,000 in the venture; yet they might have been warned from the first that it stood on a treacherous foundation. It is now admitted that the sum of £62,000 was squandered in floating the undertaking, of which amount £56,000 has since been disgorged, and further disclosures are expected to be made. At an extraordinary general meeting of the shareholders on Wednesday last, it was stated that the attempt to obtain money on a new issue of mortgage debentures had failed, not more than £39,260 having been subscribed; that the International Financial Society had presented a petition to the Court of Chancery for the purpose of winding up the company; and that the only means of saving anything for the shareholders was to pass a resolution for winding up voluntarily. The chairman, however, in making that announcement, said he should be very sorry to hold out the prospect to the original shareholders of their getting any return of their money. When afterwards called on to explain how the capital of the company had been lost, he said the money had been simply dissipated by mismanagement, and he mentioned a few figures to show how it had gone. Out of the £625,000 subscribed capital with which the directors started, they had to provide, in the first instance, £56,000 as caution-money, which was at once locked up. They entered into a contract for the construction of the works for £653,000, which was £78,000 in excess of the money in hand. They then purchased coal and fittings to the amounts of £40,000 and £80,000 respectively; they paid the concessionaires £25,000, and interest to the shareholders, £38,000. Other items for salaries, directors fees, wages, loss of gas, &c., brought the amount up to £900,000, leaving a deficiency of about £300,000. That sum was borrowed at exorbitant interest, the payment of which added to the embarrassment; and these circumstances, as the chairman observed, fully accounted for the collapse of the company, without supposing any further misapplication of the funds. The shareholders seem to possess full confidence in Mr. Godfrey, the present chairman, who was appointed one of the liquidators, and he promised not to shrink from making any exposures which in the course of his investigations of the accounts might come to light.

Of the many schemes that have from time to time been proposed for producing artificial light, there was none which more alarmed the shareholders of gas companies than the project for naphthalizing common air, and thus dispensing with gas altogether. The exhibitions of that mode of illumination were very successful; the light was clear and brilliant, and, as naphtha was cheap and air costs nothing, there seemed to be a most prosperous future for the "Photogenic Gas Company." It soon, however, came to be admitted that it was, somehow, better and cheaper to employ coal gas than common air, in the carburetting process; by degrees the prospects of the company became clouded, and they have been for some time out of sight, but now they reappear in public advertisements as being about to be "wound up" in the Court of Chancery! "All that's bright must fade," and so it has happened to the Photogenic Gas Company.

Communicated Article.

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NEW PHOTOMETER STANDARD LIGHT AND BALANCE.

By Thomas William Keates, Esq., F.C.S., &c.,
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Photometry is a subject which has risen into practical importance entirely within a few years, and which, from being a matter of scientific interest only, in the hands of the chemist and physicist, has become the sole means of fixing the value between seller and buyer of one of the most necessary of the commodities of the time—that is, common illuminative gas. Photometry is, however, unsatisfactory as a measuring process. We have to encounter, *in limine*, the difficulty that we are bound to measure by an instrument which does not supply us with any exact standard of measurement; the consequence is that the valuations made by the photometer at the present time cannot be regarded as more than pretty close approximations to the truth. Since the passing of the Gas Act of 1868, and in view of probably extended legislation upon this subject, the question as to a means of fairly measuring, and so putting a value upon coal gas, is of much more serious importance than heretofore. A small reduction in the lighting power of the gas supplied to the City, and to some other parts of the metropolis, subjects the delinquent gas company to heavy penalties; and it becomes, therefore, the more desirable either that the present form of photometer should be improved in its character and capabilities, or that some more exact and reliable form of light-measurer should be devised. At present it seems unlikely that any really new form of photometer will come into use; it is, therefore, from some alteration in the arrangements of that now employed—known as Bunsen's photometer—that the practical gas analyst and examiner will have to look for relief from his difficulties. For some time after the introduction of this photometer it was the practice to use a single sperm candle, of a defined weight, as the standard of light, and the light of the gas measured by this standard was computed at so many candles power; after a time two sperm candles were used

together—a great improvement, inasmuch as the irregularities of one candle counteracting in some degree those of the other, the light was made more regular than before, and the light of the standard being also doubled, the readings of the photometer were rendered clearer and more distinct.

Those who have been occupied with the use of the photometer have mostly found long ago that the sperm candle is a most defective standard of light measurement. The best candles burn more or less irregularly, *quoad* the particular candle; and, compared one with another, the candles differ so much in burning, although apparently alike in all particulars calculated to ensure regularity in that respect, that there has come to be a general feeling among photometrists that a new light standard is absolutely essential to the successful practice of photometry as a real means of establishing the value of illuminative gas. Every one who has experienced the uncertainty of the burning of the candles, and the difficulty and tediousness of getting them into such a condition at first as to give a fair start to the photometric experiment, must, I am convinced, be prepared to meet joyfully any reasonable proposal to substitute them by a more certain and convenient standard. For my own part, I may say that I have long been fully alive to the inconvenience attending the use of the candles, and the often most unsatisfactory character of the results obtained with them; and for some time I have been endeavouring to devise a standard which might remove the inaccuracy and inconvenience of which they are the source. I venture to think that, after many trials and continued experiments, I am in a position to propose to those interested in gas investigation, a standard of light which, if not perfect, at least surpasses not only the sperm candle, but also the ordinary French lamp standard, so far as to bring the indications of the photometer much nearer to the truth than they have hitherto been. When I first commenced my experiments upon this subject, I came almost at the very outset upon a double difficulty. I saw that the only direction in which I could look for a practical means of avoiding the use of the candle was by adopting in its place some form of oil-lamp. But in my earliest trials I found that I could not rely upon any lamp that I could obtain, and this for two reasons, operating singly or conjointly—first, the mechanical structure of the lamp was not suited to produce a uniform action in its parts; and, secondly, the fuel was of such a nature that there was no certainty that different specimens of the same kind of fuel would produce exactly similar effects in burning. In seeking for a lamp suitable to the use of the photometer, two desiderata suggest themselves at the very outset. The first of these is a regular supply of oil to the wick, at a given height and under unchanging pressure; the second, the use of a fuel unvarying in its composition and character, so that different specimens shall possess so nearly the same light-giving power, that their effect, when burned under like conditions in the lamp, may be regarded as constant. I could find no lamp in which these requirements were satisfied when I began my investigations. It would be useless to enter into an account of my various failures with lamps of two or three different kinds; shortly, I may say that I commenced by endeavouring to modify the fountain lamp so that the supply of oil to the wick might be uniform; failing these, I turned to the ordinary moderator, with the same result; and that, finally, I have succeeded in obtaining a lamp which, burning sperm oil, appears to fulfil the objects in view in a degree which I had scarcely hoped to arrive at. In the course of a long professional connexion with one of the largest of the oil-refining houses, I had acquired an intimate knowledge of the character of the burning oils, and of the peculiar circumstances attendant upon their preparation for the market. This knowledge enabled me to perceive at once that the number of oils from among which fuel for a standard light could be selected was very limited; and further reflection and experiment lead me to the conviction that there is, indeed, but one kind of oil fit for this purpose. Before, however, deciding upon the fuel to be burned, I had before me the problem of making the lamp capable of burning it. As I have already stated, I began my experiments upon the fountain lamp, which I soon gave up, and then began some trials with the common moderator. I found, however, two defects in this lamp, both of which were capable of destroying the uniformity of its action; these were the moveableness of the chimney—that is, the capability of the chimney to be raised or lowered so as to increase or diminish the sharpness of the current of air thrown in upon the flame, whereby the oxidation of the burning material could be increased or lessened; and the way in which the oil was supplied to the wick by the action of the spring and piston throwing it over the upper edge of the metal wick-holder—governing, indeed, by the height of the overflow of the oil, the distance to which the flame could descend into the wick. Both these points in the construction of the lamp I looked upon as destructive to its uniform action. In the case of the chimney, if it were placed at different heights at different times, the amount of oxidation of the fuel would vary, and the height, colour, and intensity of the flame would also become inconstant; and in that of the oil supply, the height of the oil flowing over the edge of the burner would affect the height of the flame, and, I think, also its colour. The quantity of oil made to overflow, of course, depends upon the action of the spring which forces down the piston in the body of the lamp, and this action, being in proportion to the tension of the spring, is greatest immediately after winding up, and grows progressively less until the piston is quite down. It is true that there is a regulating arrangement, in the moderator lamp, to make the overflow uniform; but, so far as I have seen, this is not effective, and practically the matter is as I have described. I, however, found that the principle adopted in the moderator, of throwing up the oil to the wick by a mechanical contrivance, was convenient and effective; and I have overcome both the defects which I have described in the lamp, with the kind assistance of Mr. Armstrong, of the firm of Messrs. Gardner, of the Strand. I determined upon fixing the chimney at a definite height, and I overcame the difficulty as to the irregularities of the overflow by making a row of holes one-eighth of an inch in diameter in the wick-holder, half an inch below its upper edge, so that the overflow of oil, instead of taking place over the upper edge, should be half an inch lower down, leaving the oil to be raised from that point to the flame by the capillary attraction in the wick itself. As an improvement upon this plan, Mr. Armstrong suggested that four slots in the wick-holder would provide a better outlet for the superfluous oil than the holes mentioned, and he has made me a lamp in which the slots, which may be seen in the drawing, can be covered by a sliding cylinder of thin metal, so that the overflow can be slightly raised or lowered at the height of about half an inch from the edge of the wick-holder.

In this arrangement of lamp I believe that I have obtained almost all that can be desired in relation to the lamp *per se*. The next point to be disposed of was that concerning the fuel; and here the limits of inquiry were very narrow, and lay, indeed, practically only between refined rape oil and sperm oil. I believe that a worse or more uncertain material than refined rape or colza oil could not have been proposed for burning as a standard of light. The refining of this oil is effected by severe chemical treatment. The oil is treated with the strongest sulphuric acid, and the final result is dependent upon several points, of which the manufacturer possesses so little knowledge, and over which he can exercise so little control, that no two batches of refined rape oil can, strictly speaking, be supposed to possess exactly the same burning properties. The age of the seed, the difference in variety of the seed, the quantity of acid used in refining, the strength of the acid, the time the oil is beaten with it, and the method used in bringing the oil into condition for the market, all affect its quality as burning oil, and give to it an uncertainty of character which renders it unfit for use in producing a standard light. I have already said that I consider only one kind of oil fit for this purpose—that is, sperm oil. In the first place, sperm oil is, among the fixed oils, beyond all comparison the best fuel for lamps. Where refined rape oil can be burned six or eight hours, sperm oil can be burned 15 or 16, even then producing much less of the charring of the wick which other oils produce more or less rapidly, and which reduces the light progressively from the very first. Sperm oil is a natural production in the form in which we have it; it is only filtered to separate from it the solid spermaceti with which it is naturally mixed, and it never undergoes any chemical treatment, so that its constitution is in no wise altered artificially. Various specimens resemble each other so closely that no difference can be detected in their manner of burning, and, what is of great importance, the specific weight of sperm oil is so far removed from that of the other fat oils, that adulteration with inferior oil cannot be carried on without being easily detected. With regard to this point, I may, however, remark that the weight generally set down in books as the specific weight of sperm oil —·8750—is quite inaccurate. I have never had an opportunity of examining a sample with lower specific gravity than ·8790, and the sperm oil to be obtained in commerce possesses a specific weight rising to ·8810. The best sperm oil is known as colonial oil; when used for producing a standard light it should be filtered in the winter, so that the last portions of spermaceti may be removed from it. Such oil should have a specific gravity of ·880, or a little less, and when burned in a common cup lamp, with a few threads of cotton for a wick, it ought to give a bright and even light so long as any of the oil remains.

The dimensions of the lamp in which I propose to burn the sperm oil as a standard are as follows, the body of the lamp, with spring and piston, being that of an ordinary full-sized moderator:—

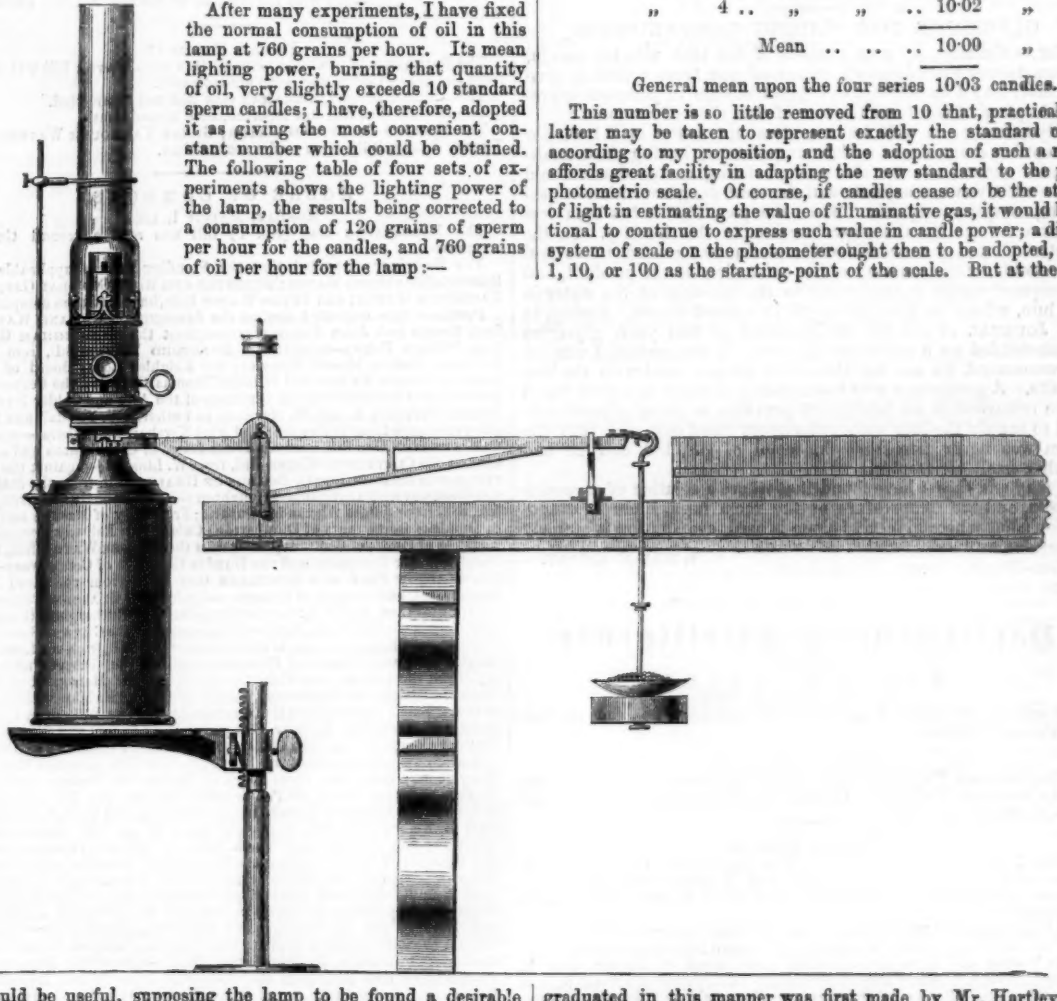
External diameter of the outer tube of the burner..	1·08 inch.
Internal diameter of inner tube of the burner ..	0·75 „
Whole height of chimney	9·45 „
Height to shoulder of chimney outside	2·35 „
Internal diameter of bottom of chimney	1·90 „
Internal diameter of top of chimney	1·20 „
Regulator of overflow, mean distance below the edge of outer tube	0·50 „
Mean height of flame, burning about 760 grains of oil per hour, about	2·50 „

The wick used in the lamp is the common sperm-oil wick, 1 inch in length, weighing, when dry, 7·60 grains.

Some time since I published, in the JOURNAL OF GAS LIGHTING, an account of a candle balance adapted to the photometer-bar, so that the weighings of the candles could be made *in situ*. The lamp which I have described is attached to the photometer, and can be weighed with the greatest exactness by a modified and improved form of that balance, as is shown in the woodcut. I have, however, added to the apparatus a table or support, upon

which the lamp rests. This table, which is shown in the drawing below the lamp, can be raised or lowered by the rack and pinion, and fixed at the proper height by a screw. The whole weight upon the central knife-edges of the balance is somewhat more than 7 lbs., which is reduced to a minimum by the balance being constructed with arms of unequal length; and the balance, which is very simple in its structure, is sufficiently delicate to turn distinctly with about the one hundred thousandth part of the gross weight. The regularity with which this lamp burns is very satisfactory, and it is easy, after a little practice, to start it at once with a consumption of oil approaching closely to the quantity which it is intended that it should burn. The following table shows how little the consumption varies in successive given periods, even when calculated for the whole hour:—

Quantity of Oil Consumed.	Time in Minutes.	Consumption of Oil Per Hour.
100 grs.	8·06	744·4 grs.
100 „	8·10	740·7 „
100 „	8·25	727·2 „
100 „	8·06	744·4 „
100 „	8·08	742·5 „
100 „	8·07	743·4 „
100 „	8·03	747·1 „
100 „	8·00	750·0 „
100 „	8·00	750·0 „
100 „	8·00	750·0 „



After many experiments, I have fixed the normal consumption of oil in this lamp at 760 grains per hour. Its mean lighting power, burning that quantity of oil, very slightly exceeds 10 standard sperm candles; I have, therefore, adopted it as giving the most convenient constant number which could be obtained. The following table of four sets of experiments shows the lighting power of the lamp, the results being corrected to a consumption of 120 grains of sperm per hour for the candles, and 760 grains of oil per hour for the lamp:—

First Series.

Experiment 1 ..	Lamp equalled ..	9·84	candles.
„ 2 ..	„ „ ..	10·07	„
„ 3 ..	„ „ ..	9·82	„
„ 4 ..	„ „ ..	9·97	„
Mean		9·92	„

Second Series.

Experiment 1 ..	Lamp equalled ..	10·13	candles.
„ 2 ..	„ „ ..	10·10	„
„ 3 ..	„ „ ..	10·13	„
„ 4 ..	„ „ ..	10·43	„
Mean		10·19	„

Third Series.

Experiment 1 ..	Lamp equalled ..	10·09	candles.
„ 2 ..	„ „ ..	9·93	„
„ 3 ..	„ „ ..	10·07	„
„ 4 ..	„ „ ..	9·99	„
Mean		10·02	„

Fourth Series.

Experiment 1 ..	Lamp equalled ..	9·98	candles.
„ 2 ..	„ „ ..	10·00	„
„ 3 ..	„ „ ..	10·00	„
„ 4 ..	„ „ ..	10·02	„
Mean		10·00	„

General mean upon the four series 10·03 candles.

This number is so little removed from 10 that, practically, the latter may be taken to represent exactly the standard of light according to my proposition, and the adoption of such a number affords great facility in adapting the new standard to the present photometric scale. Of course, if candles cease to be the standard of light in estimating the value of illuminative gas, it would be irrational to continue to express such value in candle power; a different system of scale on the photometer ought then to be adopted, taking 1, 10, or 100 as the starting-point of the scale. But at the outset, it would be useful, supposing the lamp to be found a desirable standard, to be able to adapt it to the present photometric scale; and this can be done without difficulty, so soon as the real value of the lamp is ascertained in candles. This number, whatever it may be, is a constant; to arrive at the lighting power of the gas, it is only necessary to multiply the result read off in candles on the photometer, by the constant number of the lamp, to obtain the value of the gas expressed in candles. If the power of the lamp be taken at 10 candles, as I have suggested, no calculation will be required; it will then only be necessary to move the decimal point of the reading in candles on the photometer one place to the right to find the correct final expression of value. Thus, 1·01 candle becomes 10·1; 1·10 becomes 11·0 candles, and so on. The only change necessary in the photometer scale would be the further division of the 10ths of candles into 10ths, which would then represent 100ths of a candle. I am informed that a photometer scale graduated in this manner was first made by Mr. Hartley for a candle photometer, but in the case of the substitution of the greater light of the lamp such a division of the scale is an obvious necessity.

A glance at the drawing which accompanies this article will show at once the arrangement and mode of action of the apparatus described.

The lamp is arranged *in situ* at the end of a common bar photometer. The knife-edges at the forked extremity of the balance suspend it by means of a collar with lateral steel plates, which are slightly hollowed, and which rest on the knife-edges. The table, which can be raised and lowered by a rack and pinion, is seen below the lamp. The course of an experiment is simply as follows:—The lamp, being burning at its proper rate, is put in its place on the balance, and the table brought to such a height that when the weights in the counterpoise are properly adjusted the beam will be

a little depressed at the lamp end. As the oil burns away, the lamp, of course, becomes proportionately lighter, and in a short time the lamp end of the balance will begin to rise, and the weight to pass over to the distal end. As the index passes the zero of the scale, the time must be noted, as this is the commencement of the experiment. The weight which is to represent the consumption of oil in any given time through which it is intended that the experiment should last, must next be placed upon the little shelf made in the shoulder of the lamp, and the effect of this will be to render the lamp again heavier than the counterpoise, so that it will be brought back upon the table, where it will remain firmly seated until the experiment is completed. When it is expected that the oil represented by the weight is about to be exhausted, the balance must be again watched, and the time taken as the index passes over the zero the second time; this gives the time of the consumption of a given weight of oil, and from this the lighting power of the lamp must be rectified to a consumption of 760 grains of oil per hour, according to the general practice. In all other respects the experiment is conducted as an ordinary photometric experiment with the candles, the only difference being that, having obtained the reading of the scale in candles, the result must be multiplied, as I have already explained, by the constant number of the lamp, to bring the expression of the lighting power of the gas up to its actual value.

Correspondence.

GLYCERINE FOR SLIDING GAS-PENDANTS.

SIR,—Noticing, in your number of the 16th ult., the painful circumstances attending an escape of gas from a sliding gas-pendant, may I be allowed to suggest the use of common glycerine in place of water for the lute of that class of pendants?

Glycerine, as is well known, does not freeze at a low, nor perceptibly evaporate at a high temperature; having these qualities, its general use for the lute of sliding gas-pendants would make what you not unjustly call the most dangerous kind of gas-fitting comparatively safe. Since the year 1860 it has been less or more in use for the above purpose in this locality. In the winter of that year considerable alarm was caused to several households by the bursting of the outer pipe of the pendant, and consequent escape of gas, owing to the freezing of the water in the lute, where the pendants were in unused rooms. Seeing, in the JOURNAL of the 4th of December of that year, glycerine recommended as a substitute for water in wet meters, I was led to recommend its use for the above purpose, and with the best results. A gentleman who has a sliding pendant in a very warm room remarked to me lately that previous to using glycerine he had to supply the lute with water every third day, and that the room was never free from the smell of gas, but now he had neither smell nor trouble.

I may add that I have found that where a solution of glycerine is used, and the temperature of the room high, there is evaporation; but where glycerine alone is used, evaporation is scarcely appreciable.

Gas-Works, Annan, March 8, 1869. WILLIAM EWART.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, MARCH 1, 1869.

A petition was deposited against the MILNROW GAS Bill, from the Corporation of Rochdale.

THURSDAY, MARCH 4.

The DORKING WATER; MILNROW GAS; WALTHAM ABBEY AND CHESHUNT GAS; and WALTON-ON-THAMES AND WEYBRIDGE GAS Bills, were read a second time.

FRIDAY, MARCH 5.

The ILKLEY GAS; SHOTLEY BRIDGE AND CONSETT DISTRICT GAS; BRIDGEND (GLAMORGANSHIRE) GAS AND WATER; CONSETT WATER; HARROGATE WATER; OXFORD GAS; and WEST SURREY WATER Bills, were committed.

The ABERDARE AND ABERAMAN GAS Bill was read a second time.

Petitions were deposited against the BRIDGEND (GLAMORGANSHIRE) GAS AND WATER Bill, from the Bridgend Local Board of Health; Jane H. Nicholl; and S. Cox and another;—against the CONSETT WATER Bill, from the Dean and Chapter of Durham; the Newcastle and Gateshead Water Company; the Tyne Improvement Commissioners; Sir W. A. Clavering, Bart., and others; and Sir A. E Monck, Bart.;—against the HARROGATE WATER Bill, from the Harrogate Improvement Commissioners;—against the OXFORD GAS Bill, from the Oxford Local Board;—and against the WEST SURREY WATER Bill, from the London and South-Western Railway Company, the Kingston Highway Board; and T. N. Allen.

MONDAY, MARCH 8.

The BRIDGEND (GLAMORGANSHIRE) GAS AND WATER; HARROGATE WATER; and WEST SURREY WATER Bills, were referred to a Select Committee, consisting of Lord Mont Eagle (chairman), Earl Ducie, Lord Foxford, Lord Colchester, and Lord Wrottesley, who will sit on Thursday, March 11, at eleven o'clock.

Petitions were deposited against the WALTHAM ABBEY AND CHESHUNT GAS Bill, from the Enfield Gas Company, and from the Ponders End and Enfield Highway Gaslight and Coke Company;—and against the WALTON-ON-THAMES AND WEYBRIDGE GAS Bill, from T. N. Allen.

TUESDAY, MARCH 9.

The DORKING WATER, MILNROW GAS, WALTHAM ABBEY AND CHESHUNT GAS, and WALTON-ON-THAMES AND WEYBRIDGE GAS Bills, were committed.

The Standing Order Committee reported that the Standing Orders not complied with in respect of the BRIGHTON AND HOVE GENERAL GAS Bill ought to be dispensed with, and the Bill allowed to proceed, provided that a clause be inserted in the Bill prohibiting the company from manufacturing, upon any lands to be acquired under the powers of the Bill, any residual products arising from the manufacture of gas;—that the Standing Order not complied with in respect of the OLDHAM CORPORATION WATER, &c., Bill ought to be dispensed with, provided that the powers contained in clauses 3 and 14, relating to the incorporation and application of the provisions of the Railways Clauses Consolidation Act, 1845, with respect to the temporary occupation of lands, be struck out of the Bill;—that the Standing Orders not complied with in respect of the KEIGHLY WATER Bill ought to be dispensed with, provided that the limits of deviation of the Water Theddles Reservoir be confined to the county of Lancaster;—and that the Standing Orders not complied with in respect of the EDINBURGH AND DISTRICT WATER Bill ought to be dispensed with.

A petition was deposited against the DORKING WATER Bill, from the inhabitants of Dorking.

THURSDAY, MARCH 11.

The BRIGHTON AND HOVE GENERAL GAS Bill.—The Chairman of Committees informed the House that the promoters do not intend to proceed further with the Bill during the present session.

The HARROGATE WATER Bill.—The Select Committee reported that they had not proceeded with the Bill, no party having appeared in opposition thereto.

The WEST SURREY WATER Bill.—The Select Committee reported that they had not proceeded with the Bill, the opposition thereto having been withdrawn.

FRIDAY, MARCH 12.

The BRIDGEND (GLAMORGANSHIRE) GAS AND WATER Bill was reported from the Select Committee, with amendments.

The ABERDARE AND ABERAMAN GAS Bill was committed.

The ILKLEY GAS Bill was reported, with amendments.

The BISHOP'S STORTFORD WATER; GREAT YARMOUTH WATER; and the TRURO WATER Bills, were read a second time.

HOUSE OF COMMONS.

MONDAY, MARCH 1, 1869.

The BARNSTAPLE GAS (No. 1) Bill was read a second time, and committed.

The Examiners reported that the Standing Orders applicable to the BISHOP'S STORTFORD WATER; BRIGHTON AND HOVE GENERAL GAS; GREAT YARMOUTH WATER; and TRURO WATER Bills, have not been complied with.

Petitions were deposited against the ACCRINGTON GAS AND WATER Bill, from George and John Hargreaves;—against the BIRMINGHAM GAS Bill, from William Potts;—against the BRADFORD WATER Bill, from Eli and Benjamin Foster; Messrs. Knowles; the Keighley Local Board of Health; Thomas French Wallace and William Thomas Carlisle; the Corporation of Halifax; the Undertakers and Directors of the Aire and Calder Navigation; William Ferrand; B. and W. Marriner and others; W. Yewdall and Son and others; George Emnott Pawson; and Abel Kershaw and others;—against the CLECKHEATON GAS Bill, from the Local Board of Cleckheaton and others;—against the CLEVELAND WATER Bill, from W. Linskill;—against the DUKINFIELD AND DENTON LOCAL BOARDS OF HEALTH Bill, from the Stalybridge Gas Company and inhabitants of Houghton;—against the DUMBARTON WATER, &c., Bill, from James Alexander Guthrie; Fraternity of Masters and Seamen in Dundee; inhabitants of Dumbarton; Caledonian Railway Company; and Trustees of Estate of Scotscraig;—against the DUNDEE WATER Bill, from the Dundee Water Company, and the Dundee Chamber of Commerce;—against the GLASGOW CITY AND SUBURBAN GAS Bills, from the Lord Provost, Magistrates, and Council of Glasgow;—against the GLASGOW CORPORATION GAS (PURCHASE, &c.) Bill, from the Corporation of Rutherglen; Glasgow Gaslight Company; Caledonian Railway Company: and the City and Suburban Gas Company of Glasgow;—against the GLASGOW GAS Bill, from the Lord Provost, Magistrates, and Council of Glasgow;—against the GREAT CENTRAL Gas Bill, from the Gaslight and Coke Company and the Metropolitan Board of Works;—against the GREENOCK WATER Bill, from Sir Michael Robert Shaw Stewart, Bart.;—against the HUDDERSFIELD WATER Bill, from the Lancashire and Yorkshire Railway Company; the London and North-Western Railway Company; and the Calder and Hebble and Aire and Calder Navigation Companies;—against the IMPERIAL GAS Bill, from the Vestry of St. Marylebone; West Ham Local Board of Health; the Metropolitan Board of Works; and the Vestry of Paddington;—against the KINGSTOWN TOWN Bill, from the Commissioners of Kingstown;—against the MARYPORT TOWN AND HARBOUR GAS Bill, from consumers of gas and others; Maryport Trustees; and London and North-Western Railway Company;—against the MOSSLEY WATER Bill, from the Manchester, Sheffield, and Lincolnshire Railway Company; the Earl of Stamford and Warrington; Corporations of Ashton-under-Line and Stalybridge; Stockport and Ashton Turnpike Road Trustees; Corporation of Stockport; owners, &c., of works on River Tame and Mersey; and the London and North-Western Railway Company;—against the NOTTINGHAM WATER Bill, from the Barford Local Board and the lessees in trust of Sir John Sutton, Bart.;—against the RADCLIFFE AND PILKINGTON GAS Bill, from the Prestwich Local Board; Radcliffe Local Board; and merchants, &c., of Radcliffe and Pilkington;—against the ST. HELEN'S BOROUGH IMPROVEMENT Bill, from the British Plate Glass Company; Daniel Willis; Earl of Sefton; Messrs. Robertson Gladstone and others; the Reverend James Abraham; the Parr Local Board: Messrs. Amos Hanson and others; Samuel Taylor; the Marquis of Salisbury; the London and North-Western Railway Company; and Thomas Dicconson;—against the SOUTH METROPOLITAN GAS Bill, from the Metropolitan Board of Works;—and against the WEST HAM GAS Bill, from the Metropolitan Board of Works.

TUESDAY, MARCH 2.

Petitions were deposited against the ACCRINGTON GAS AND WATER Bill, from consumers of gas and others; the Accrington Local Board; the Oswaldthwistle Local Board; and seven from ratepayers of Oswaldthwistle.

WEDNESDAY, MARCH 3.

The MANCHESTER CORPORATION WATER-WORKS AND IMPROVEMENT Bill was read a second time, and committed.

The GLASGOW CORPORATION GAS (NEW WORKS, &c.); the SPALDING WATER; the BARNSTAPLE GAS (No. 2); the OLDHAM CORPORATION WATER, &c.; and the DARWEN WATER Bills, were read a first time.

A petition was deposited against the MANCHESTER CORPORATION WATER-WORKS AND IMPROVEMENT Bill, from the Stockport District Water-Works Company.

THURSDAY, MARCH 4.

The KEIGHLEY WATER Bill, and EDINBURGH AND DISTRICT WATER Bill, were read a first time.

Petitions were deposited against the DUMBARTON WATER, &c., Bill, from James White;—against the KINGSTOWN TOWN Bill, from the Dublin, Wicklow, and Wexford Railway Company; the Corporation of Dublin; and the ratepayers of Kingstown;—against the MANCHESTER CORPORATION WATER-WORKS AND IMPROVEMENT Bill, from Abram Haworth; Lord Edward George Fitzallan Howard and John Chapman; and Charles Bostock;—and against the OLDHAM CORPORATION WATER, &c., Bill, from the Manchester, Sheffield, and Lincolnshire Railway Company.

The NOTTINGHAM WATER; WEST MIDDLESEX WATER; BRYMBO WATER; and CLEVELAND WATER Bills, were referred to a Select Committee, consisting of Lord Henley (chairman), Mr. C. Carnegie, Mr. W. J. Legh, Sir A. Maitland, and Sir John Duckworth (referee), who will sit on Tuesday, March 16, at twelve o'clock.

The WEST HAM GAS; MARYPORT TOWN AND HARBOUR GAS; and DUKINFIELD AND DENTON LOCAL BOARDS OF HEALTH Bills, were referred to a Select Committee, consisting of Mr. Philips, Mr. De Grey, Mr. Nicholson, and Mr. Assheton, who will sit on Tuesday, March 16, at twelve o'clock.

FRIDAY, MARCH 5.

Petitions were deposited against the BARNSTAPLE GAS (No. 1) Bill, from the Barnstaple Gas Company, Limited;—against the KEIGHLEY WATER Bill, from Thomas French Wallace and William Thomas Carlisle, and the Oakworth District Local Board of Health;—and against the MANCHESTER CORPORATION WATER-WORKS AND IMPROVEMENT Bill, from the trustees of Edmund Buckley, deceased, and the trustees of the late Duke of Bridgwater, and Mersey and Irwell Navigation Company.

SATURDAY, MARCH 6.

Petitions were deposited against the BARNSTAPLE GAS (No. 1) Bill, from owners, &c., and gas consumers in Barnstaple, and James Oliver;—and against the MANCHESTER CORPORATION WATER-WORKS AND IMPROVEMENT Bill, from the Corporation of Stockport; Henrietta F. H. E. Perreau; occupiers of lands, &c.; and the London and North-Western Railway Company.

MONDAY, MARCH 8.

The BARNSTAPLE GAS (No. 2) Bill, and SPALDING WATER Bill, were read a second time, and committed.

Petitions were deposited against the BIRMINGHAM GAS Bill, from William James Loveridge;—and against the MANCHESTER CORPORATION WATER-WORKS AND IMPROVEMENT Bill, from owners and occupiers of water-wheels, &c.

TUESDAY, MARCH 9.

The GLASGOW CORPORATION GAS (NEW WORKS, &c.); the KEIGHLEY WATER; and the OLDHAM CORPORATION WATER, &c., Bills, were read a second time, and committed.

A petition was deposited against the OLDHAM CORPORATION WATER, &c., Bill, from the owners, &c., of works on the rivers Tame and Mersey.

WEDNESDAY, MARCH 10.

The DARWEN WATER Bill was read a second time, and committed.

Petitions were deposited against the KEIGHLEY WATER Bill, from Michael and George Merrall; W. Yewdall and others; and the Local Board of Health for the district of Haworth.

THURSDAY, MARCH 11.

The OSWALDTHWISTLE LOCAL BOARD Bill was read a first time.

Petitions were deposited against the BARNSTAPLE GAS (No. 2) Bill, from promoters of the Barnstaple Gas (No. 1) Bill;—against the EDINBURGH AND DISTRICT WATER Bill, from the North British Railway Company;—against the MARYPORT TOWN AND HARBOUR GAS Bill, from the London and North-Western Railway Company;—and against the WEST MIDDLESEX WATER Bill, from the Vestry of St. Pancras.

FRIDAY, MARCH 12.

Petitions were deposited against the GLASGOW CORPORATION GAS (NEW WORKS, &c.) Bill, from the City and Suburban Gas Company of Glasgow;—against the KEIGHLEY WATER Bill, from John Craven and others;—against the OLDHAM CORPORATION WATER, &c., Bill, from the Corporation of Stockport; the Earl of Stamford and Warrington; Henry Gartside; the Mossley Water-Works Company; Corporations of Ashton-under-Lyne and Stalybridge; Dukinfield Local Board of Health; Stockport and Ashton Turnpike Road Trustees; millowners and others on the Chew Brook and river Tame; and Edwin Hyde Clarke;—and against the SPALDING WATER Bill, from the Great Northern Railway Company.

SATURDAY, MARCH 13.

Petitions were deposited against the BARNSTAPLE GAS (No. 2) Bill, from the Barnstaple Gaslight Company, Limited, and owners, &c., gas consumers and inhabitants of Barnstaple;—against the EDINBURGH AND DISTRICT WATER Bill, from the Provost, Magistrates, and Commissioners of Police of Selkirk; Sir John Murray, Bart.. and others; Lord Napier; and William Brown and others;—against the GLASGOW CORPORATION GAS (NEW WORKS, &c.) Bill, from the Glasgow Gaslight Company and trustees of the late George Wilson;—against the KEIGHLEY WATER Bill, from the Keighley and Worth Valley Railway Company;—against the NOTTINGHAM WATER Bill, from Sir John Sutton;—against the OLDHAM CORPORATION WATER, &c., Bill, from Lord Abinger and Sir Willoughby Jones, Bart.; the London and North-Western Railway Company; the Corporations of Ashton-under-Lyne and Stalybridge; James Heywood Whitehead and William Jackson Rideout; John Lees and others; and the Mossley Local Board;—and against the SPALDING WATER Bill, from J. Dodsworth and others, and the Marquis of Exeter.

Legal Intelligence.

VICE-CHANCELLOR'S COURT.—SATURDAY, MARCH 13.
(*Before Vice-Chancellor Sir* W. M. JAMES.)

CITY OF MOSCOW GAS COMPANY, LIMITED.

In this case two petitions had been presented to wind up the company—one by Messrs. Anthony Gibbs and Sons, shareholders and creditors; the other by Messrs. Oxenham, debenture-holders.

Mr. DRUCE, Q.C., who appeared on the first petition, said the company was registered in April, 1865, under the Joint-Stock Companies Act, 1862, for the purpose of obtaining and working a concession for lighting the town of Moscow with gas. It appeared that the whole of the capital of the company had been called up, and they were now indebted to Messrs. Gibbs, the petitioners, in the sum of £82,594; besides which the petitioners were shareholders for upwards of 4000 shares, on which they had paid in the shape of calls more than £100,000. In a report recently issued by the directors it was stated that, in order to work the company, a further sum of £530,000 was required, and a special meeting of the shareholders was convened to ascertain whether that money could be obtained. In consequence of the appeal of the directors not being adequately responded to, this petition was presented, and the question to be submitted to the court was whether there should be a compulsory winding up or a voluntary liquidation under supervision. If matters had remained where they were when the first petition was presented, he (Mr. Druce) would not have thought it necessary to add a word, but, since then, a meeting of the shareholders had been held, at which it was resolved to wind up the company voluntarily, and the chairman and Mr. A. Cooper were appointed liquidators. He could not help thinking that, in the face of the numerous decisions of late respecting the advantages of a voluntary liquidation in such cases, he should find it difficult to support the prayer of his petition, which was for a compulsory winding up, especially when it was considered that, in the former case, if any person had cause to complain of the conduct of the liquidator or the mode of procedure, he could come to the court and obtain relief. This was all he would have said, but for an allegation in the counter petition to which he must take exception, and upon which he must offer an observation. After Messrs. Gibbs' petition was presented, and with the full knowledge of the fact, a petition by certain creditors was filed, in the tenth paragraph of which they said: "Messrs. Gibbs and Co. have presented a petition to this honourable court, praying that the company may be wound up, but your petitioners are informed and believe that the said petition was presented in consequence of some arrangement or understanding between that firm and the directors of the company, and that the petitioners cannot be relied upon to prosecute their said petition, or to deal with it otherwise than for the purpose of such arrangement or understanding. Your petitioners, moreover, are informed that a part of such arrangement is that an order for the voluntary winding up of the company shall be secured, and that liquidators, favourable to the views of the firm and the said directors, shall be appointed; though, as your petitioners submit, it is of the greatest importance to them as debenture-holders and creditors of the company, and also as shareholders, and that, under the circumstances, it is not only expedient, but just and equitable, that the company should be wound up by the order and under the supervision of this court, and that the person appointed to act as official liquidator should not be the nominee or under the direct influence of the board of directors, or the holders of those securities for which such priority is claimed as aforesaid." He thought the last few lines of that allegation showed that the object of the petition was not for the benefit of that company, but to secure the conduct of the liquidation. He took the gravest exception to the allegation that persons who were debenture-holders to the extent of upwards of £82,000, and who had shares in the concern to the enormous amount which Messrs. Gibbs had, could be supposed to have any other object in view, apart from their *status* in the question, than to realize in the best way possible the assets of the company. A second petition, having the same object as the first, was altogether unnecessary, or if presented it ought not to be launched with the averment that the petitioners in the first could not be trusted, and that they were mere tools of the directors. He called the attention of the court to this paragraph in order to say that though he was prepared to accept the voluntary liquidation under supervision, it was not at all in consequence of such unfounded imputations as those which were made against them.

Mr. KAY, Q.C., in support of the petition of Messrs. Oxenham, submitted that, by the practice of the court, an order for the voluntary winding up of a company was never made against the expressed wish of creditors. Since the presentation of the first petition there had been such an arrangement attempted to be carried out, that, though on the face of it the petition purported to be for the compulsory winding up of the company, it was a mere subterfuge, and what was intended was to get a voluntary winding up, with the chairman of the company as one of the liquidators. The position of the company was this—that there was an enormous debt, that all the shares had been paid up, and the contributors had no interest whatever in the matters. The directors issued debentures without having the power to do so, and the unfortunate persons who lent their money on those debentures had got nothing, and were now merely in the position of contract creditors. They were anxious, therefore, that the thing should be wound up for the benefit of all the creditors, and not for the benefit of those only who were in league with the directors who committed this fraud. His clients were holders of debentures to the amount of £1200 each, as well as shareholders in the company, and they asked the court to make an order on both petitions for the compulsory winding up of the company.

Mr. J. NAPIER HIGGINS, who appeared for the company, said his learned friend had no right to make the statement that the first petitioners were in league with the directors by whom the debentures were issued. None of the present directors were members of the board at that time. The chairman was formerly a member of a committee of investigation into the company's affairs, and was afterwards elected a director. He was unanimously chosen by the shareholders to be a liquidator under the voluntary winding up.

Mr. KAY said the appointment was really made by those who had no interest whatever in the concern, unless it could be shown—which it had not been—that something would hereafter come to the shareholders.

Mr. LOCOCK WEBB was about to reply, when

The VICE-CHANCELLOR said he thought it was a case in which an order for winding up voluntarily should be made. The debenture-holders would have full opportunity of appearing, and the chairman of the company was not alleged to be any party to what had been called a fraud, but which certainly did not look so in the petition. It merely said they issued debentures which they had no power to do, but it did not say the petitioners were deceived thereby. In respect to any questions between the debenture-

holders and other creditors; they could be fully disposed of in the winding up. At all events, Messrs. Gibbs were creditors to the extent of £82.000, and they would have the greatest possible interest in making the most of the property, which was what was wanted to be done in all liquidations. Under all the circumstances, he should make an order upon the first petition for the voluntary winding up of the company under the supervision of the court. There would be no order upon the second petition, but the petitioners would have one set of costs for appearing upon the first petition.

DORSETSHIRE LENT ASSIZES—MONDAY, MARCH 8.
(*Before Mr. Justice* BYLES.)

THE GAS EXPLOSION AT WEYMOUTH.

HANN *v.* THE WEYMOUTH GAS CONSUMERS COMPANY.

This was an action to recover compensation for damages sustained to property through an explosion occasioned by the alleged negligence of the defendants servants. It was a special jury, and the amount claimed was £2000.

Mr. LOPEZ and Mr. COLLINS (instructed by Mr. R. N. Howard, of Weymouth) appeared for the plaintiff, and Mr. COLE, Q.C., Mr. KINGDON, Q.C., and Mr. PINDER (instructed by Messrs. Tizard and Co., of Weymouth), were for the defendants.

Mr. LOPEZ, in opening the case, said the plaintiff in this action was Mr. Thomas Hann, a confectioner and baker, carrying on business in Weymouth. The defendants were the Weymouth Consumers Gas Company, and they likewise, as such company, carried on their business at Weymouth. From the pleadings which had been opened by Mr. Collins, he thought the jury would have gathered what were the nature and character of this action. Suffice it to say this was an action brought by the plaintiff against the defendants—the gas company—for the purpose of recovering from them compensation for damage for alleged neglect on their part in respect of certain gas-fittings and gas repairs which they had done for plaintiff for hire. He need hardly tell them this was a case of the utmost importance to the plaintiff. Plaintiff was a man in humble circumstances, and the result of this negligence had been the entire loss of his property. His house had been almost entirely destroyed, and his stock and goods lost. The result of this action was a matter of the most serious importance to him. He thought he might also say there were certain incidents in this case which in the details that must come before their notice—viz., the sad death of a person employed in the plaintiff's shop—made the action not only of importance to the plaintiff, but to the community at large. They knew in these days that all, more or less, were dependent upon companies in the position of the defendants for the light they used every day. To almost every house, and almost every shop and public building, gas was supplied by persons in the position of the defendants. He thought he need not say it was most important that they should exercise due skill, due judgment, and due caution in the discharge of the responsible duties which were imposed upon them. As he considered the law on this matter—and he would trouble them with but few remarks more before he proceeded with the facts—it was very clear, and appeared to be this: if any persons held themselves out for reward to do certain things which required skill and judgment, they were bound to bring to the discharge of that duty competent skill, competent care, and sufficient judgment. He thought they would be told by his lordship that if any persons who held themselves out for hire did not bring such skill and competence as he had mentioned, they then became liable for any injury inflicted upon property or person as in this case. He would now endeavour to lay the facts of this case before them, without any further introduction, as clearly and as lucidly as he could. As he had told them, plaintiff was a baker and confectioner, carrying on business in Weymouth. They would learn that some four or five years ago he took a lease of a piece of land in Bond Street, upon which he erected a house, at a cost of £1000. He (the counsel) alluded to that fact because the damage to the house would be a material part of the case. He carried on his business in that house from the time he built it to the time of the accident, with gas supplied to it, and never from the time the house was built had there been a cause of complaint or anything suggestive of an accident with respect to the gas. Before he could make this case clear, it would be necessary to lay plans before them, and they would see from the first what the elevation of the house was. The plan of the elevation, which he held in his hand, was that from which the house was built. He would now draw their attention to the ground plan, because it was very necessary they should understand the location, at any rate, of three apartments in that house. The house itself faced Bond Street. There was a large plate-glass window facing the street; on the west side of the window was a shop entrance, and on the other side a private entrance into the house through a passage. The shop occupied the front part of the house, and there were two apartments behind filling up the same space as the shop, which were the kitchen and bakehouse, but the floor of the latter was a considerable depth below the shop, and the ceiling of the bakehouse was about half-way up the height of the shop. He had gone into this explanation for this reason, that unless he did so he could not explain the situation of the stairs. When the passage was entered, some stairs had to be ascended; on the left were some more, which descended into the shop; and going a little way farther the kitchen could be entered on a level. On going farther into the passage and turning to the right, they would come to some ten or twelve steps which led into the bakehouse. Unless the jury had seen the premises it would be difficult to understand the plan, but he had had the advantage of seeing the place, and hoped he had made the plan clear. That being the situation of the apartments, he would now draw their attention to a plan which had been agreed upon by both parties. From this they would see that there were both a shop door and private door, between which was the shop window. Between these doors, and inside the shop, was a stall-board, about a foot or little more above the ground. This was a kind of cupboard, which shuts up. He would now ask them to give him their attention whilst he explained how the gas was laid on to this house, for that was a material question. In the front of the shop window was Bond Street, and along the window was the main gas-pipe. He was informed that the company's works were some short distance off, and that gas was brought under the Backwater by means of a tunnel. However, the main was laid in the centre of Bond Street, and if the jury looked at the elevation of the house and the plan, which showed the arrangement of the pipe, they would see the inlet was brought in close to the passage door; in fact, was brought in at the bottom of the cupboard, which he called the stall-board, and through a hole in the floor was the tap. This tap would be a most important item in the case, because it was the main-tap which turned the gas off from the house, and, as they contended, was under the control of the company. The gas was from this conducted into the meter by the inlet-pipe, and conducted out on the other side by a service-pipe. This tap was connected with the main service and the meter by two screws. The screw on the street side was called the female screw, and that on the other side the male screw. The gas was taken into the meter, then carried to the house, and immediately it got into the passage it ascended to the ceiling. It was then carried along the ceiling of the passage, again descending was carried into the kitchen, and thence to the bakehouse. In the latter place were three lights, two in front of the oven, and one bracket-light on the other side of the oven. In the shop there were two gaslights, one on either side of the shop, and one on the counter, which was carried to that point by a compo pipe. He would now proceed to relate the facts of the case. It seemed that previous to the 28th or 29th of August, 1868, great dissatisfaction prevailed with regard to the supply of gas, and meters were found—at any rate, were thought to be—incorrect in registering the amount of gas supplied, and instead of properly measuring the quantity of gas used, the company sent in what were called computed accounts. That was, they formed an opinion as to the quantity of gas consumed, and based the charge upon that opinion. The plaintiff was one of those persons who thought they had reason to complain of having an incorrect register, and accordingly he made an application to the company, some time in August, requesting that his old meter might be taken away, and a new one substituted. In consequence of this, on Friday, the 28th of August, a man named Frampton came to the plaintiff's house for the purpose of putting in a new meter. The old meter had been taken away on the 3rd of August previously. The company sent the meter, and accordingly Frampton went on Friday and proceeded to put it in. If the jury looked at the plan they would see the state of things with regard to the meter and the gas-pipes on that day. He believed that after the meter had been put in, plaintiff felt satisfied that everything had been done which was necessary, and gave himself no trouble or concern about it. About five o'clock, however, coming home from a walk, he entered his house by the private door. He thought he smelt gas. At first he imagined it was some gas water which had been spilled about during the operations of the day, and took no heed of it; but, finding it became worse, he got a candle and proceeded along the passage, and as he was going into the shop an explosion took place, which caused him a most serious injury. But that was not the explosion upon which the present action was based. A considerable portion of his goods were damaged, his face was much injured, and his hands much hurt. The meter put in by Frampton in the morning was entirely blown from its connexion. The position of the plaintiff next day was this: it was necessary that he should have a light in his shop that night, and he therefore went to the office of defendants, who promised to connect the main-pipe with the service. Accordingly, about three o'clock on the 29th of August, two men, sent by defendants, and their workmen, named Frampton and Atkins, came to the house of plaintiff. They came about three o'clock, and proceeded to perform certain operations there. They remained until six, and he (the counsel) believed he should be able to satisfy the jury, in the course of the evidence which he should lay before them, that these men, during the time they were discharging their duties, were perfectly intoxicated. They went away leaving the work as they believed to be completed. The plaintiff, about a quarter after ten, had occasion to go into his shop, and from thence into the passage. As he passed by he saw Miss Cooper, his assistant, in the shop. He had not gone very far before he smelt a strong smell of gas. Smelling that, he went into the bakehouse, turned on the lights, and found they were all right. He then proceeded up the stairs leading from the bakehouse into the passage, and had only got about half-way up, when a terrible explosion, to which he (the counsel) should have to call the attention of the jury, occurred. The plaintiff heard the explosion and saw a flash of light. The next thing he saw was the shop window entirely blown out, and everything in the shop scattered in the street. Portions of the joists were driven into the ceiling above, and he (Mr. Lopez) regretted to say something more painful even occurred. On his return to the shop a short time after the explosion, he found Miss Cooper, whom he had seen shortly before in it, buried beneath the *débris* of the house. She was most seriously injured, was taken to the hospital, and died within four days. These were the facts of the case. He refrained at present from going into further details of damage. He could bring many witnesses who would prove that the house had been substantially destroyed. He should prove to them that plaintiff had suffered the greatest loss in trade, and had been unable to proceed with his business, and that he had been under medical treatment. After this sad accident every precaution was taken to keep the place where the explosion occurred intact, so that no one should be allowed to alter the position of the pipes. On the Monday following, Mr. Howard, who was now plaintiff's attorney in this case, but who at that time had no connexion with the plaintiff, as agent for the company in which the property was insured, had the premises put under the care of the police, and they so continued until the time of the coroner's inquest a few days after. The coroner, feeling the importance of the case, at his own expense, had the most eminent man from London, Dr. Odling, who gave evidence before him. The jury returned their verdict, but he would not say what that was; suffice it to say it was accompanied with some allusion to defendants. Dr. Odling went over the whole of the premises which had been undisturbed, and he would give the jury his scientific opinion as to the cause of this calamity, and would tell them what he found on that occasion. Perhaps it would be better for him, at that stage of the case, not to suggest what he believed to be Dr. Odling's opinion as to the cause of this sad calamity. It was sufficient for him to show that the explosion actually happened, and he should leave it for his learned friends on the opposite side to suggest the means by which they sought to evade their liability. He should wait with considerable anxiety to know how his friend, Mr. Cole, would make his defence. He (Mr. Lopez) should prove that from the time plaintiff's house was built, down to the 28th of August, when the defendants servants were called to attend to the gas, there had been no cause of complaint, no smell of gas, or any difficulty with it. That was a fact which could not be controverted. If that were so, he should like to know what caused the explosion, unless it was caused by the acts of defendants servants. But his case would not stop there. He should be able to show, by the most satisfactory evidence, that the men defendants employed to discharge these responsible duties were not in a fit and proper state to do them. With these few remarks he would leave the case in the hands of the jury. At all events, he would have an opportunity of addressing them again, and it might be necessary to do so even at greater length than he had now done. He should then have had the benefit of the whole of the evidence laid before him, and of hearing what account his friends proposed to give of this transaction.

The following evidence was then called:

Mr. *Thomas Hann*, examined by Mr. COLLINS.

I am plaintiff in this action, carrying on business as baker and confectioner at Weymouth. The house in Bond Street is my own. I laid out some money five or six years ago to build it. At that time the gas was laid on. A young man named Howe did it. He laid it on for Mr. Webb, a

man who carried on business as a gas-fitter at Weymouth. From that time until the 28th of August, 1868, nothing went wrong with the gas. The gas company are supposed to keep account of what gas is burnt by meter. I disputed their account. On the 28th of August the meter was taken away from me. The old company supplied the original meter. The new one was supplied by defendants. This was put up on the 28th of August. This was on a Friday. It was put under the stall-board.

The JUDGE: What is a stall-board?

Witness: The stall-board is a place where we put our things; it is closed up like a cupboard; it runs along the length of the window by the street; it is about 16 inches from the ground, more or less. My premises consist of a shop; at the back of the shop is the counter; behind that there is a space, and then there is a bakehouse a little below. The flooring of the bakehouse is below the flooring of the shop, and a little above the flooring of the shop is the kitchen. I have a private door to my house. I have to go up this passage, get up some steps, go down a few more, and then get into the shop. The entrance to the kitchen is on a level with the top of the steps. [Plan produced.] The gas enters my premises on the right side of the window facing my shop, under the stall-board, where the meter is, and nearly under the door on the left-hand side. It comes up through a hole in the shop floor. There is a tap immediately above the hole. Then there is a long pipe running up the passage communicating with the meter by a hole knocked in the passage wall, which is taken up to the top of the stairs, and carried to different parts of the house. There is one light on the counter, and a bracket on either side of the shop. In the bakehouse there are two brackets, and the light in the kitchen comes down from the centre of the ceiling. In the bakehouse there is one bracket nearly opposite the oven, between two air bricks. On Friday, the 28th of August, William Frampton put up a fresh meter. This was done some time before dinner. In the afternoon, about five o'clock, I smelt gas in the passage as I was coming in. I took a candle and tried the pipes all round, but could not find any escape. I tried the passage pipes, and went into the kitchen and bakehouse.

The JUDGE: And in the shop?

Witness: No, my lord; I tried all but the shop. I could not find any leakage at all. I went out in the evening, and returned about ten o'clock. On my return I smelt gas still stronger. I entered the house by the private passage. At that time the shop was closed for business, and the lights were put out. I went down into the shop with a candle, thinking there might be a leak at the meter. When I opened the stall-board door, an explosion took place, which knocked me from one end of the shop to the other. My face was burnt, and a great many of the things were smashed. The wood of the window-bench of the stall-board caught fire. I had some porter and beer in bottles in stock. When the explosion took place about seven or eight dozen were broken. A lot were packed under a round table, and some on shelves. Some of the beer and porter was spilt on the floor. The meter was disconnected. When the pipe caught fire I pulled it out from under the stall-board, disconnected the meter, and placed it in the shop. On Saturday I went to the gas office. I saw Frampton and Atkins. I did not see the manager at the time; those I have mentioned were the only persons present. I asked Frampton if he would put me in a light. I keep open till half-past ten or eleven on Saturday nights. Owing to the meter being blown away I had no light, so far as gas was concerned. He said he would come up directly. I said that if he did not I would see Mr. Thomas. I think Mr. Thomas was secretary at the time. In the morning of Saturday Mr. Thomas came into my shop to see the destruction, and Mr. Charles as well.

Mr. LOPEZ: Is Mr. Charles vice-chairman?

Witness: Mr. Thomas and Mr. Charles hold some office in the company.

The JUDGE: It is singular there was no complaint made to the gas office until the afternoon. When did Mr. Thomas and Mr. Charles come?

Witness: They came about half-past ten or eleven in the morning. Frampton and Atkins came to my house between three and four. They sent for a man named Howe to tell them which way the pipes were laid. He came and showed them, after which they sent for a man named Rose to cut a board to find out where the compo pipe lay. The board was not taken up, and nothing was done with the compo pipe. Frampton and Atkins afterwards went to the gas office to make what they call a "bend." I do not know how soon they came back, because I was knocking about the town on business. It was five o'clock when I returned the first time, and the men were then at work about the pipes. The meter was taken away. They had taken it to the office. I observed the state of the men at five o'clock; they seemed as if they had been drinking. I went from the shop, and remained about five minutes. I noticed they were at work in the passage about the joints. I went out, and returned pretty close on six o'clock. Frampton was then in the bakehouse. I said I hoped he had got everything right and secure, and he assured me he had. At that time he appeared to be tipsy, and Atkins was about the same. When they came into my house, I gave them half a pint of beer each, but I had not turned my back five minutes before they got another glass each out of Miss Cooper.

Mr. COLE: Did you see it?

Witness: I did. I told Miss Cooper she was not to give them any more drink without consulting me. I went out after I had tea, between six and seven; and was in and out of the shop the whole of the night. At nine o'clock I went to market, and returned about a quarter past ten. I then entered my house by my shop door. The shop was still open and lighted. I did not observe anything in the shop then. I passed through it, and went into the kitchen to speak to the servant about Sunday's dinner. When I was there I smelt gas. Miss Cooper was then behind the shop counter. I went into the bakehouse, taking a candle with me. I lighted all three lights there, and turned them out again. The pipes in the bakehouse were all right. After that I came up the bakehouse stairs to go into the kitchen. I had the candle still in my hand. I had got up all the stairs with the exception of about four when I heard a loud explosion, and saw a flash come through the passage. The flash appeared to come from the shop. I could not see the shop from where I was standing. When I went to the shop door I found everything blown to atoms. The shop window was blown to pieces and the stall-board as well.

Mr. COLE: I think it would be better to try the question of liability here, and refer the question of damage to a surveyor.

Mr. LOPEZ: I shall not raise any objection.

The JUDGE: If you get a verdict, it will not signify to you; and, if the other side get it, no harm will be done.

Mr. LOPEZ: We are not giving evidence with respect to damage. It is only to show where it took place, and the force of it. The witnesses for the damage are quite distinct, and we shall not call any of them now.

Witness: The shop floor was blown up, the joists were blown into the street, the ceiling of the shop was very much damaged, and the drawing-room floor was blown up. The upper rooms were also damaged. A loaf of bread was blown into the rafters of the shop ceiling.

Mr. COLE: Bread was rising very rapidly then.

Witness: The counter was blown towards the inner wall. Miss Cooper was buried beneath the counter. My servant was blown into the street, but was not hurt, as the window went first. After the explosion I saw Miss Cooper buried beneath the rubbish; she died four or five days after.

The JUDGE: How old was she?

Witness: Thirty-two years of age. Directly after the explosion took place, the police took possession of the premises. I do not know whether anything was placed upon the pipes that night. My furniture and stock-in-trade were not insured.

Cross-examined by Mr. COLE: I built the house myself; Mr. Thomas Dodson was the builder. Howe laid on the gas for a person named Webb; I gave the order to Webb, and he directed Howe to do it; I paid Webb for laying on the gas. Webb had nothing to do with the tap under the stall-board. Mr. Church put it there; he belonged to the old company. [Plan produced.] I paid Mr. Webb for everything that was connected beyond the meter, and nothing before. He connected the gas from the meter. I know there is a main in the street, which must be brought by a pipe into my shop. Mr. Church brought it in; I did not pay him for that work.

The JUDGE: It is the duty of the gas company to supply the pipe up to the meter.

Witness: I never paid for it; I know Mr. Webb put my fittings from the meter.

Mr. LOPEZ: We are going to call the man who put in the fittings.

The JUDGE: Did the escape take place before the gas got to the meter?

Mr. COLE: This is for my friends to show.

Mr. LOPEZ: I think I shall be able to show that it took place on the company's side of the meter.

Mr. COLE: I say at the time of the explosion there was no meter.

The JUDGE: Do you agree there was no meter there at the time?

Mr. LOPEZ: Yes, my lord. The main-pipe and the pipe connecting with the service-pipe were supplied by defendants.

The JUDGE: You both agree that the meter was removed and something else substituted, which appears to have been some new piping with three soldered joints. Whose workmanship do you say this was?

Mr. LOPEZ: Clearly that of defendants workmen.

Mr. COLE: I do not dispute that at all. Your lordship must not put out of sight the syphon, which we say caused the first explosion.

The JUDGE: There is no action brought for the first explosion; the action is for the second. The two questions raised are, first, what was the cause of it; and secondly, who had the doing of the work which caused it?

Mr. COLE: I contend that the syphon was the cause of the first accident.

Cross-examination continued: I never had the bill from Mr. Webb for doing my gas; there was a cross account between us. He did not bring in the gas from the main. I saw the meter there before Howe connected the pipe. I am in the habit of keeping my gas turned on; I never turn it off at the tap. There was a syphon there. I do not remember when this was taken to Mr. Read's to be repaired. Mr. Seymour was never employed by me. Mr. Webb might have put the syphon there. I have always paid my gas bills until I disputed by accounts. I only had one notice from the company to pay my bills. It was not in consequence of my not refusing to pay my bill that the meter was taken away. After the meter was removed I paid my bill, and then a new one was sent. The men came soon after three on Saturday. They were quite sober then. When I came back about six Frampton was not examining the work he had done under the stall-board. He was in the bakehouse. I afterwards came into the shop and found Frampton lying down examining the work under the stall-board, but I did not hold a candle for him. I did not see him light a match to see if it was all right. He said to me, "It is all right, you will have no mishap to-night." That was when he came from under the stall-board into the shop. I was talking to a lady while Frampton was under the stall-board. Atkins was there at the same time. The men were sober at three, but at five o'clock they appeared to have had a drop.

Mr. COLE: How came you to let them stay there?

Witness: I did not consider they were so far gone but what they could get on with their work. I will swear they were not sober. I did not see they had had so much but what they could manage. It was after that when the man went on his stomach and said it was all right. I cannot remember if I gave them a glass of beer or not when they went away. I will not swear I did or did not. I pulled out the meter on Friday night, and it was taken away on Saturday morning. It was in the same state then as when I pulled it from the stall-board. I threw blankets on it to put out the fire; it was on fire in every joint. I did not notice if the pipes of the meter were melted. The meter came out easily enough.

Re-examined by Mr. LOPEZ: I was injured, and had to go under medical treatment. The present company about a year ago succeeded the old company.

Mr. LOPEZ: I hold the Act of Parliament by which the new company succeeded the old one.

The JUDGE: Let me look at it. I want to see whether the new company stand in the shoes of the old one. After perusing the Act for a brief period, he said: At present it appears to me that the new company represent the old one. In fact, this particular work was done in the time of the old company.

Re-examined: Mr. Church was the manager for the old company. The old company laid down the pipe up to and including the meter, but Mr. Webb laid it on for me; therefore the tap is on the defendants side of the meter. The cause of dispute between me and defendants was because my bill was 10s. 9d. more than it was the quarter previous. I thought there ought to have been 1000 feet taken off. It was in consequence of this that I wished for the meter to be changed. Between three and six o'clock on Saturday I was from home, and was not aware what Frampton and Atkins had to drink. There is a public-house nearly opposite, kept by Mr. Muston; I saw Frampton come out of this house. The bill produced is one which has been sent me by defendants since the explosion.

Mr. LOPEZ said before he called the next witness he wished to mention his reason for doing so. The witness was Mr. Frederick Arden, clerk to the borough magistrates, who would produce the deposition of Miss Cooper, taken shortly before her death. It would be for his friends to say whether they would object to it as evidence. However, he would take the responsibility of tendering it.

Mr. COLE: It is no evidence.

The JUDGE: My own impression is, that it is not admissible. If it had arisen in a case where the subject-matter was an inquiry into the death of Miss Cooper, then it would be admissible. I think the defendants counsel are right in objecting to it.

Mary Hoddinott, examined by Mr. LOPEZ.

In August last I was in the service of MR. HANN. I remember on the 29th of August last seeing two men there about the gas. They came shortly after three o'clock; I did not see them again until five. About that time I went into the shop for some scales. Frampton then came in, and asked Miss Cooper for a bottle of pale ale. She denied him, saying that Mr. Hann had desired her not to give him any more beer. He said he did not want her to give it him, he could pay for it, I did not stay to see whether he had any or not. I saw both of the gas-men between six and seven. Atkins asked me to light a candle, and he and the other man went into the bakehouse. I remember Mr. Hann coming into the house soon after ten. I heard him tell Miss Cooper that there was a smell of gas. I did not see what he did, but I heard him go into the bakehouse afterwards. When the explosion took place I was at the kitchen door, over the bakehouse. I heard the explosion and saw the light, and next found myself in the street. I was blown from the kitchen into the street.

Cross-examined by Mr. KINGDON: When they asked me for a candle it was shortly before six. They appeared to be about half tipsy when they asked me for a light. I do mean to say it. I was examined before the coroner. I then said they had been drinking. I did not say before the coroner that I noticed the men were half tipsy. I cannot remember if I said one of the men was the worse for liquor at five o'clock.

Alfred Keynes, examined by Mr. COLLINS.

I am a baker, in the employ of Mr. Hann. I was in his house on Saturday, the 29th, about four o'clock in the afternoon. Soon after I went out to deliver bread. I returned about five, and saw Frampton. I was taking some bread into the shop when he and a man named Hall came. They came into the shop to have some drink. Frampton asked Miss Cooper for some, when she refused. He appeared to be drinky. About six o'clock I was in the bakehouse. Both Frampton and Atkins came there. Frampton said, "Now let's try your lights." He was drunk then. He tried two, but the third would not light. He unscrewed it at the joint, but then it would not burn. He then took a pair of pincers to take off the nipple, when it broke. He did not put on a new one, but there was a light after that. The men were cursing about having to work so late. They said they had been working until half-past seven last Saturday night, and it would be half-past seven before they would leave that evening. I said, "Never mind; you will make a quarter," meaning a quarter of a day. They said, "Who will pay us for the quarter? not our masters." I said, "The gas company will;" when they said, "The gas company be d——; they will chase us for it." After they lighted the three burners they left, saying it was all right. I was in the bakehouse when they came down. One of them "flounced," and nearly fell down. I did not see them go away.

Cross-examined by Mr. COLE: They were drunk when they came into the bakehouse. I said so before the coroner. There is no mistake about it. They had nothing to do in the bakehouse, excepting to see if the burners would light. They talked to me the same as other men with beer. Frampton said the burner was all right when there was a big flame. The staircase leading into the bakehouse is rather dark. After the men left I did not smell any gas. I had never smelt gas in the bakehouse. I never remember ever having a leak there.

Re-examined by Mr. LOPEZ: The men broke the gas-nipple off whilst at work. One nearly "flounced" downstairs, and the other could scarcely hold a light steady.

Mary Hood, examined by Mr. LOPEZ.

I am the wife of James Hood. I live next door to Mr. Hann. I recollect, on Saturday, the 29th of August, seeing the gas-men passing to and fro to Hann's house. I saw Frampton from three till five. He was then intoxicated.

Cross-examined by Mr. COLE: I have not made any claim against the company, but I have a claim against them. I cannot say whether the men were drunk at three, but at five they were intoxicated. I was watching them from three till five. I was in my shop. I carry on a china business. I was against the shop window, and could not help seeing them. I will swear that they could not walk straight at five o'clock.

Re-examined by Mr. LOPEZ: My shop was damaged. I lost about £40 worth of goods, but up to the present time I have not made any claim against the company.

Ann Eliza Muston, examined by Mr. COLLINS.

My father keeps the White Hart. This is about 60 or 80 yards from Hann's house. I remember the day of the explosion. I know Frampton. He came into my house in the afternoon. He came there four or five times. He had half a pint of beer each time. Atkins was with him. When they were together they had a pint between them. They were in a state of intoxication when I saw them last. I have seen drunken men before.

Cross-examined by Mr. COLE: They were in a state of intoxication between three and four. I noticed them first so a little after three. There is no mistake about that. They had three and a half pints of beer between them before three o'clock. Our beer is very strong.

Re-examined by Mr. LOPEZ: It is very good beer. I do not know what they had to drink before they came to my house.

The JUDGE: How do you sell the beer?

Witness: Sixpence per quart.

George Howe, examined by Mr. LOPEZ.

I am a gas-fitter, living in Weymouth. Some years since I was in the employ of Mr. Webb, and was engaged to lay on the gas-fittings in Mr. Hann's house. I laid on the gas-pipes from the meter. From the meter I carried it through the house. I had nothing to do with the pipes outside the meter. On Saturday, the 29th of August, Frampton came to me for some instructions respecting the laying of the pipes in Hann's house. I went there, and gave him instructions.

Cross-examined by Mr. COLE: He was as sober as I am. This was between three and four o'clock. Atkins was perfectly sober. I was there from five to ten minutes; I pointed out where the pipes went. I do not remember putting a syphon there. I examined the tap, after the explosion, with Dr. Odling. There was a defect in the plug. When the tap was turned off it leaked, but when it was turned on the gas passed through it. When I examined the tap it was turned off. I tried it with a light and it leaked, but this leakage went into the pipe, not into the air. It was sound top and bottom, therefore so long as the pipe was on no damage could take place. Any one trying it outside could discover the leak. This had been caused by corrosion.

Re-examined by Mr. LOPEZ: The leakage would be from the plug into the pipe. When the tap was turned off it would not let the gas escape, for the defect was in the plug. Dr. Odling examined the screw in my presence; I simply went to show Frampton the pipes, and came away again. I saw Dr. Odling test it, but did not see any escape.

Police-serjeant *Harvey*, examined by Mr. COLLINS.

I remember the night of the explosion. After it occurred the police took possession of the premises. The superintendent of police at that time was Mr. Lidbury, but he has since died. The pipe was sealed up on Monday morning.

Reginald Woodcock, examined by Mr. LOPEZ.

I am a gas-fitter. I have been in business at Weymouth for 30 years, served an apprenticeship of seven years, and have had 30 years experience. I fitted up the theatre and most of the public buildings in Weymouth. I was sent for on the Monday morning after the explosion; the premises were then in the hands of the police. Some one from the gas company was sent for to make an examination with me, but after waiting some time, and finding no one came, I made an examination of the pipes. I was employed by Mr. Howard on behalf of the insurance company. I commenced by examining the service-pipe. This was a pipe which communicates from the street to the meter. I found the tap in a very loose state; it had not been screwed up tightly. There was a leakage underneath it. I unscrewed the tap with my fingers. It was not a proper way for it to have been left in; it ought to have been fastened with gas-tongs. No explosion could have made the tap loose if it had been properly screwed on. The effect of an explosion would be that it must be blown to pieces; it could not have been loosened. I then examined the tap, and found there was a leakage in the plug. The effect of such a leakage would be that it would ascend and get between the stall-board and the floor. The distance between the two is about 15 or 16 inches. The tap and main belong to the company. I have no hesitation in saying that the tap was not properly fixed. I should think that if a quantity of beer or porter was spilled, the floor would soak.

The JUDGE: Boards may soak, but they do not get drunk.

Mr. COLLINS: They get tight, my lord.

Witness: I sealed up the tap, and placed a piece of canvas on it. Gas was escaping from it up to the time of the inquest.

Cross-examined by Mr. COLE: Mr. Dodson was there at the time. The leakage was at the joint of the pipe. The tap may have leaked ever since it was put there—five or six years ago. When I examined it the stench was enough to knock any one down. I did not put a light to the tap. I did not see any continuation-pipe.

Mr. COLE: Gas-fitters get tight sometimes, don't they?

Witness: I dare say they do.

Mr. COLE: Were you not examined before the coroner?

Witness: No; because I had an engagement with another gentleman.

Mr. COLE: Were you not so drunk that you could not give evidence?

Witness: I will swear I was not. I was at the Royal Hotel until three o'clock. Mr. Luce would not allow me to leave the building.

Mr. COLE: Did the coroner sit until eleven at night?

Witness: That one did, and till twelve for what I know.

Mr. COLE: What were you doing at the Royal Hotel?

Witness: I was looking after the gas. There had been a theatrical performance at the Royal Hotel, and Mr. Luce pays me so much a year to see to the gas, and he would not allow me to leave the place that night. He said that if I was wanted they must summon me.

Re-examined by Mr. LOPEZ: Frampton would have to undo the screw in placing a new meter. It would be his duty to screw it on to the service-pipe as tightly as possible; but having regard to the state in which I found it, he could not have done so. Such an explosion as we have heard of would not have caused the screw to become loose, if properly fixed; it would have been torn away. It was between eleven and twelve at night when the coroner's verdict was given.

By the JUDGE: The person who took away the meter had nothing to do except to remove the tap. He would not have to touch the tap, unless he found it was loose. It is a common thing to remove meters.

TUESDAY, MARCH 9.

Mr. *William Reeks*, examined by Mr. LOPEZ.

I am a builder, living at Weymouth. I was on the jury at the coroner's inquest, and viewed Hann's house. The gas-pipe was sealed up, and covered with brown paper. I took off the paper, and examined the pipe. A man named Martin got a light, On his putting a light to it, the gas burnt all round. There was a leak where the pipe joined the service, at the bottom of the plug, and at the screw towards the meter. I afterwards went with Mr. Woodcock, and had it taken off. It was entrusted to me and sealed ap.

Cross-examined by Mr. COLE: I do not know much about gas. I am not a practical gas-man to know where a leak is, and cannot find out the hole where the leakage was. I think a man named Russell, an ironmonger and gas-fitter, was there. I kept the tap in my possession until yesterday, when I handed it over to Mr. Howard.

Re-examined by Mr. LOPEZ: When I applied a light the gas burnt.

William Martin, examined by Mr. COLLINS.

I am a gas-fitter at Weymouth, where I have been in business for 16 years. On the Monday morning after the explosion I went to Hann's house and looked at the main-pipe. There was nothing the matter with it. I looked at the tap, and found there was an escape from it on the rim. It also escaped from both sides of the plug. In shaking the tap I found it was loose at the bottom. I think it was not screwed on very far on the iron pipe; in fact, it turned in my hand. The tap ought to have been screwed on much farther than is represented by the bright screw. There is every evidence it had not been screwed on more than three threads on the pipe. There was no washer on it. It is usual to put one, or else a grammet—a bit of twine pressed round the pipe with some white lead. The pipe could not be air-tight without a ground plug. The duty of a gas-fitter is to see that the tap is screwed down properly. I went with the coroner's jury to view Hann's premises. The service-pipe was then sealed up. I broke the seal and applied a light to the tap in the presence of the jury. The gas from it came out in a mass of blaze at once. This was before anything was done to the tap. I applied the match at the tap, and the gas flew up and lit bodily. I do not think an explosion would loosen the screw. If properly screwed down the explosion would have no effect on the screw on the main-pipe. The screw in the thread of the cap and lining might be loosened, because the force would carry away the pipe.

Cross-examined by Mr. COLE: I can swear that a violent explosion would not loosen the tap. I went to Hann's house on Monday morning. I was working opposite, and went there. No one asked me to go. I went to satisfy myself. I did not pull about the screw to see if it was loose. I simply twisted it round. There was no washer on the tap. There is one there now.

Mr. COLE: So much for your gas opinion. I will not trouble you with any more questions.

Re-examined by Mr. LOPEZ: The washer is cut through on the edges and hard. It would be the duty of a gas-fitter to take off such a one and put on another. It was the grating of the edges of the brass which made me say there was no washer. I gently moved the washer when I tried if

it was loose. It required very little exertion to start it. If properly screwed on, tongs would be required to take it off.

Mr. *Howard*, examined by Mr. COLE.

I am a solicitor at Weymouth, and for the plaintiff in this action. I am agent to the Liverpool and London Insurance Company, in which plaintiff's house is insured. The house is insured for £800. I remember the 29th of August. I was at the post-office when I heard the explosion, and, on behalf of the insurance company, I gave the police possession of the premises within five minutes afterwards. I went to look for Hann. The police kept possession of the place until Monday. I passed by from time to time, and saw them in possession. On Monday morning I wrote a letter to the secretary of the company, Mr. Tizard, stating that it was my intention, with competent persons, to examine the premises, and asking for some person from the gas company to be present. I received no answer, and about ten o'clock went over the premises with Mr. Woodcock, Mr. Martin, and Mr. Lidbury. I saw Mr. Wills, and asked him if Mr. Tizard was at his office, when he said he was not come yet. Mr. Charles came soon after, and I asked him if he represented Mr. Tizard, when he said he did not. Knowing that the directors of the gas company were assembled a short distance off, I sent Mr. Thomas Dodson to them, to know if they would come and examine the premises; but no one came. After waiting some time, I examined the place. I found the gas escaping from the main. Mr. Martin examined the tap, and said: "It is quite loose; this is the cause of the disaster." I afterwards had the pipe sealed down. I was present when the coroner's jury viewed the premises. Martin broke the seal, and when lighted there was a mass of flame.

Cross-examined by Mr. COLE: I wrote the letter about five minutes after ten. Mr. Dodson stated he had seen Mr. Tizard, who said the directors would not come. Mr. Dodson is a person who examines premises for me when there is a fire, on behalf of the London and Liverpool office.

Mr. *Samuel Webb*, examined by Mr. COLLINS.

I am a general merchant and shipowner at Weymouth. I saw the explosion. I was within 20 yards of the house. I was speaking to some one, when I heard glass crack, which lasted ten or fifteen seconds. After that there was a noise, and a dull cloud came over the street. I went to Hann's house, and prevented any lights being brought there. About five minutes after I examined the tap, and found gas escaping because the tap was turned on. I put my finger on it, whilst a young man turned it off from the main. I did not examine the tap then to ascertain if there was any escape. I went there again on the Monday.

Cross-examined by Mr. COLE: I put the gas into the house originally. Mr. Church took it from the main into the meter. I saw his men do it. I cannot tell whether he was paid or not. I do not know whether he charged the consumer for bringing it from the main. There was a syphon for one light which I put.

Dr. *Odling*, examined by Mr. LOPEZ.

I am a Fellow of the Royal Society, and lecturer on chemistry at St. Bartholomew's Hospital. I have for many years given much attention to gas matters, and have had my attention drawn to explosions of gas, and explosions of various kinds. I have been consulted by Government with regard to these matters from time to time. I came down to Weymouth on the occasion of the gas explosion at plaintiff's. I was asked to come down by the coroner, and my coming was quite unconnected with plaintiff. I was present at the view made by the jury of plaintiff's premises. I also made a particular view of them about two o'clock the same day; the witness named Howe was with me. Gas is most explosive when it stands in relation to air at certain quantities. Its most violently explosive condition is when the proportion of gas to air is one to seven.

The JUDGE: What is the proportion?

Witness: The gas is one and the air seven. Comparing it with gunpowder, a cubic foot of that matter will have the same explosive power as an ounce of gunpowder. If there is a larger proportion of gas than one-seventh, it would be as easily exploded, but not so injurious. When the proportion of gas forms one-fifth, the explosive power is very feeble. At larger proportions than one-fifth, it burns, but does not explode. If the quantity is greater, it would not light but explode. It is the property of gas, when escaping in large volumes, to ascend, but at the same time it spreads in every direction. Gas ascends in consequence of being light With a very small leak it diffuses itself in all directions. The tap stood upright in the stall-board cupboard; it was close to the floor, and beneath it was the hole from whence it came. Under the floor of the cupboard was the ground. If gas had been leaking in small volumes at that place, it would have gone under the floor and into the cupboard. I examined plaintiff's premises, and found that an explosion had taken place. I found the building one mass of rubbish and *débris*. It was evident the force of the explosion was greater in front than behind. It would be from the stall-board and in front of the counter. Very little of the floor was left, and some of the boards were blown into the ceiling. I examined the tap when Howe was present. I was present in the morning, and saw Martin light the gas. The tap leaked between the plug and the barrel on each side. I cannot call to mind anywhere else. Such a leakage would have diffused itself, and there was nothing to prevent it. I made Howe take the tap off from the service-main, take the plug out of the barrel, wipe it, and grease it, and put it back again. I told him to do his best with it. I tested it again after he had put it together, and the result was that it still leaked to the same extent as before, both where the gas was burning at the tap, and where it was turned off. I did not observe any washer at that time; there is one now, but it is greatly worn. It would be the duty of a competent gas-fitter not to have left it in the state it is. I noticed a piece of compo pipe lying in front of the shop. It was the piece of pipe used to connect the service of the house when the meter was taken away. I did not observe any other escape of gas except from the tap. There were some soldered joints in a piece of compo pipe lying by. I have no doubt the escape of gas from the tap under considerable pressure would have been sufficient to cause the explosion; I mean pressure from the main. The fact of this house being very near the gas-works would have the effect of its receiving greater pressure. The pressure at a very short distance would most likely be high, in order to carry the gas to a long distance. It is customary on Saturday nights for shops to be kept open later than usual, and consequently the gas pressure is greater than on other nights. I think it possible the explosion might have loosened the plug from the barrel as well as the tap and lining, but it would not have rendered it impossible to make the plug tight again when putting it together. The explosion could not account for the appearance of the tap, and any competent gas-fitter finding the tap in the worn condition in which this one is should have reground the plug in the barrel, or have put a new tap. Frampton ought to have discovered the leak if it existed when he was at work. If a tap of this kind had not been turned for a year or two, it would be apt to corrode.

The JUDGE: Was this tap ever used?

Mr. LOPEZ: The evidence, my lord, shows that this tap was never used; the gas was never turned off at the main.

Witness: The effect of the corrosion would be to prevent the leakage. Replacing the plug or dealing with it in any way would have the effect of removing the corrosion. If the tap did not leak, there would be an end of the matter; but if it did, Frampton should have seen where it came from.

Cross-examined by Mr. COLE: I employed Howe to assist me. He went for the express purpose of pointing out the gas-fittings. I selected him because he had placed them there originally. I heard his evidence yesterday, but do not agree with it.

Mr. COLE: Then scientific and practical men do not agree?

Witness: It is as to his statement on a question of fact. I heard him say that the leak from the tap only came into active operation when the gas was turned on, but this is not so. I am satisfied of it, for when there was a flame one foot high the gas burnt externally. Howe's evidence is incorrect with reference to the statement in a question of fact. If Howe's statement had been correct there would have been no leak, for the gas would be burning away. Howe screwed the tap tightly, and greased it with tallow as well as he could, but it leaked after that at the sides. When I was before the coroner I was of opinion there was a leak at the tap, and I said so. I also said it leaked externally. My examination before the coroner was read over to me, and I signed it. I then said I had not made up my mind that the leak which caused the explosion came from the tap. I remember distinctly saying that, I ascertained that an escape of gas took place in the immediate neighbourhood of the tap, and that was all the defects I came upon. What I had made up my mind about was that the leakage which caused the explosion came from the stall-board. There might have been a leakage from some other part or not. I made up my mind that the leakage came from the tap, but whether from any other place I had not made up my mind. I saw some joints which were properly made.

Re-examined by Mr. LOPEZ: I said I had not made up my mind that the leakage which caused the explosion came from the tap. The leakage there would have been sufficient to cause the explosion.

Mr. *Robert Spice*, examined by Mr. LOPEZ.

I am a gas engineer, living in London. I have been in practice more than 20 years. I have erected gas-works in many parts of England, and have had some of my own on lease. I have examined plaintiff's premises where the explosion was; I did so last Sunday afternoon. I have examined the tap, and formed my opinion on it. It was given me sealed up. Having regard to the state of the premises, and having heard the evidence in the case, I am of opinion that the tap contains internal evidence of its having been imperfectly fixed. The brightness of the thread shows that only one and a half thread has been screwed on one side, whereas it should have been screwed home—that is, 6, 7, 8, or 9 threads. If left in that state it might serve its purpose if undisturbed, but if disturbed, in all probability a leakage of gas would be the consequence. The cap and lining could not be dealt with without, to a small extent, unscrewing the tap from the service-pipe. The removal of the meter would account for its being partially unscrewed. If the screw was removed, it would contribute to the leakage. It would be the duty of a competent gas-fitter to have tested the screw; he ought to have used a pair of tongs. Assuming the leakage to have been at the top and bottom of the tap, Frampton ought to have discovered it, but he might fail to have done so owing to the confined space in which the meter was fixed. It might have escaped a man's notice unless he was very careful; but having regard to the position of the meter, Frampton ought to have exercised additional care in testing it. The leakage from it would be abundantly sufficient to have caused the explosion.

Mr. LOPEZ said he did not know whether the question he was about to put would be admissible, but it was whether witness, having regard to his experience of gas companies, could say if it was the usual course of business for them to retain the control of the main service-pipe up to the meter.

The JUDGE: I think it is a material question, and it was that which made me ask a similar one.

Mr. COLE: I decidedly object to such a question, and must ask your lordship to make a note of it.

The JUDGE: I think it is a legitimate question, and, if Mr. Lopez requires it, it shall be answered; but if he falls into a mistake it will involve a new trial, which may cost £500 more.

Mr. LOPEZ: I think my case so strong, my lord, that it is not necessary to have it answered.

Examination continued: The service-pipe is the one which is screwed into the main-pipe. One runs through the street, and the other is laid across to the meter. The tap is the termination of the pipe.

The JUDGE: Whose property is the tap?

Witness: Not always the property of the company, but almost universally supplied by them. I know the situation of the plaintiff's house and of the company's works. He would get greater pressure in his pipes than persons residing at a distance, so long as he was on a level.

Cross-examined by Mr. COLE: I assume that the connexion between the service-pipe and the meter was just above the tap. [At this stage of the case a meter was produced, and Mr. Cole explained to the jury the exact work which Frampton had to do.] I mean to say that in unscrewing the tap the screws were displaced. You have a new machine there, the screws of which will turn in your fingers, but the meter in question had been in use six years, and required mechanical force to remove the screws.

Re-examined by Mr. LOPEZ: A meter cannot be meddled with without displacing something. This meter having been in the house for six or seven years, the joints were fixed as well as the tap, and would not unscrew so easily as the meter produced, which is so well oiled.

Mr. COLE, in putting the case before the jury for the defence, remarked that he must say, "Defend me from scientific witnesses," his experience being that they were most dangerous advocates to a cause. They came to support a theory, and did so at all hazards, and he thought the last witness could not be taken out of the category of scientific witnesses. He (Mr. Cole) had to address the jury on the part of the gas company, and no doubt, as Mr. Lopez said in opening the case, this was a very important matter, not only to the plaintiff, but also to the defendants. Why his learned friend had lugged in what was important to the public he did not know, unless he wanted to import their sympathies into it. This was a case of law and of strict rights between the parties. A most serious and sad accident had happened, but the gas company, and the gentlemen who were the managers and directors of that company, were as morally innocent from fault as any present, and the question the jury would have to decide was, whether any of the servants of the company, by their own act or by any passive negligence, caused that accident; and if his learned friend had satisfied them that there had been such neglect, then the company must be liable. But he (Mr. Cole) should ask them

whether they were satisfied with the evidence plaintiff had given, and then he should call witnesses, who he trusted would satisfy, so far as it was possible to satisfy a jury, that everything had been done in this case by the servants of the company to ensure the safety of the work they had done. Now he must confess he could not understand the way in which his learned friend opened the case. It was for him to have shown negligence on the part of the company, but instead of that he propounded this extraordinary doctrine. The onus being on them to show neglect on the part of the company, he said, "I will first show you that an accident happened, and then I will leave my friends for the defence to get out of it the best way they can." This was a most convenient way of proceeding. He did not dare to pin himself to any theory, because he did not know how his case would come out. This was throwing a net extremely wide, and a plan which, if adopted, would be very difficult to meet. The first thing a jury wanted to know was where to place their finger upon something so as to show them the state of things which caused the neglect. His friend seemed to think that his case was a very weak one. He could not propound a theory, could not say how the accident happened, but he says, "I will create a prejudice, first, by saying that a poor girl lost her life, and that this is a public matter; and I will next suggest that the men who did the work were so intoxicated that they did the work badly because they were so." As to that he (Mr. Cole) was of opinion that his friend's witnesses proved a great deal too much. He would dwell on this part of the case at once. It being convenient to make the men intoxicated so early as half-past three, it was sworn to by Mrs. Hood that they could not walk straight in passing her shop. He did not think his friend came prepared for such evidence as that. If they were in that state, was it at all probable they would have been allowed to remain in the house for a moment? They remained at work until six, and yet the plaintiff would have the jury to believe that at half-past three they were so drunk that they could not walk. He should call many most respectable witnesses who would prove that at that time the men were sober and perfectly competent to do their work. He would pass from that part of the case for the present. The question was, how did the accident happen, and was it caused by the neglect of any one? The whole force of his friend's case depended upon whether the accident happened from the leakage in the tap. A great deal had been said about whether the main and the tap were the property of the plaintiff or the company; but the matter had been left in doubt to the jury. The last witness to whom that question was sought to be put, and which he (Mr. Cole) contended was a perfectly incorrect one, after his lordship had ruled in Mr. Lopez's favour, did not put it but for the purpose of getting its effect when he knew his case would be perilled by it. He (Mr. Cole) did not know upon after consideration if that was very material, for it would be impossible for gas companies to visit every house in order to see the state of the taps and mains. If such a duty should be cast upon a company, let them look at the state they would be in. Could a company be held liable upon such a state of things? Let them take one of the large gas companies in London—the Chartered Gas Company, for instance—who perhaps supplied hundreds of thousands of houses; would the law cast upon them the burden of inspecting the interior of their customers houses? If so, how many times a year would they have to inspect them? The thing was impossible; it was perfectly idle to suppose that such a state of things could exist. They must depend upon their customers, and it was their duty, if there was the slightest intimation of any defect to the gas machinery, to communicate with the gas company. If persons did not take care of themselves, it was impossible for others to take care of them. A very material question was this: How did the accident happen? It seemed to be, so far as he could submit to them, a matter entirely involved in mystery. It appeared that, up to the time of the meter being removed, no complaints were made, nor was there any escape of gas. The plaintiff, he must say, was not very truthful in the account he gave as to the cause of the removal of the meter. He wanted the jury to believe that it was in consequence of some defect he had it removed. But what was the real fact that he (Mr. Cole) got out of him? Why, he was in arrears for his gas. He had received a notice to pay the rates due to the company, and under the powers of their Act, when they found they could not get payment, they gave notice that, unless the account was paid in a certain time, the meter would be removed. Speaking about the removal of the meter, Mr. Cole asked how long the jury thought it had been fixed. Plaintiff said six years; but it would be shown that it had been fixed within twelve months, and was removed without the slightest difficulty. A very curious part of this case was that there were two explosions—one taking place on Friday night and the other on Saturday. On the Friday the meter had been replaced. When it was taken away had any damage been done to the pipe? There were two theories about that. One propounded was that the pipe was damaged, and the other that the tap was bad. The plaintiff was in this difficulty owing to that: if this screw had been injured when the meter was taken away, it ought to have leaked for a fortnight; but not the slightest leakage was spoken of from the 3rd of August to the 28th, when the meter was replaced. Dr. Odling's theory was that the leakage was in the tap. He said that the plug leaked, and that the leakage came from there. But why did it not leak before? There was the difficulty in the case, and it was a fact which plaintiff could not get over. The counsel would have the jury to believe that the leak was an original defect, and that the joint, when first put on, was only turned one thread and a quarter, which was untrue, because six or seven threads were touched. They were in this difficulty with regard to their second theory: if the joint was shaken when the meter was taken off, it could not help leaking for three weeks. Again, if the plug was defective when it was first put in, and the joint badly made, they must have leaked for six years. It was impossible for him to say where the gas came from, but it very curiously happened that a compo pipe ran under the floor of the shop for the supplying of the counter light. Plaintiff had not given the slightest evidence upon that, and it was very questionable if the damage had not been caused by a leak in that pipe. There was an explosion on Friday night. Where did that come from? Could the jury believe that any competent gas-man would not have examined to see if all was right? He should call Frampton and Atkins, who would tell the jury that they examined the pipes with the greatest possible care, and there did not appear to be the slightest leakage. After some other remarks the learned counsel produced a model of the piping made by Frampton for fixing on the tap so as to give a light in Hann's shop on Saturday night, and contended that every care and caution was used by defendants workmen in the discharge of their duties, saying that if there had been any escape of gas the men must have been blown from under the stall-board when the joints were tested. Mr. Cole next adverted at some length to the alleged possession of Hann's premises by the police after the explosion, maintaining that it was a complete farce, for any one could go in and tamper about with the tap—instancing the case of Martin and Woodcock. Could the jury have any doubt that the tap had been taken off and examined by half a dozen persons before it was sealed up? He hoped they would not forget that, for it was a most material fact in the case. He had nothing to say against Dr. Odling's scientific knowledge, but when it came to mechanical work he would rather have the testimony of the practical man, Howe. He said: "It is true there is a leakage in the plug, but so long as the plug is turned off there is no escape." That was a question of fact, and upon that question he would rather have the evidence of Howe than of Dr. Odling. Other practical men were called in the case, and a very curious thing was elucidated by his making use of his eyes. The man Martin said any one could get into the house without being asked questions at a time when it was in the charge of the police. He said he shook the tap, and it was really too bad for a man to be allowed to go in and tamper with the tap at a time when the police were said to be in charge of the house. The judge had heard how recklessly this man had sworn that there was no washer in the tap, but on happening to take it into his (Mr. Cole's) hand he saw there was one. Martin swore there was no washer, and when he was asked to look again he was in an awkward position, and said, "There is one." This showed how recklessly that man swore. Plaintiff did not know upon what to pin his faith. First it was said there was a defective pipe, and after that that there was a bad joint. The simple question was: Where was the leak from which the gas came? Plaintiff had given evidence to show it came from the tap, but he (Mr. Cole) should call witnesses to show that when it was left on Saturday night it was all safe. He could not show where the escape originated. His friend had said it was for him to show where the accident happened, but he (Mr. Cole) maintained it was not, and it was plaintiff's duty to show negligence on the part of the company's servants, which had not been done. He then called his witnesses.

William Frampton, examined by Mr. KINGDON.

I am gas-fitter to the gas company at Weymouth. I have been their fitter for three years. I have been upwards of 32 years a fitter. I was for many years at Dorchester. I have fixed about 358 meters, and taken down 319. I fixed one in Hann's house about twelve months ago; I removed it by unscrewing the inlet and outlet screws. I neither touched nor removed the main-tap. When I took the meter away, the main-tap was turned on, and I turned it off. On Friday, the 28th of August, I fixed another meter in plaintiff's shop, under the stall-board. That was fastened by the inlet and outlet screws, but I did not molest the main-tap. It was too far away for me. After I fixed the meter I tested the pipes. I took a lighted match and tried the joints of the meter and the joints which went across the pipe to the stall-board. I also tested the cap and lining; all the joints were tight. In the course of Friday night a policeman told me about the explosion at Hann's house. He said I had not connected the meter right. I looked for the meter, but could not find it then, but afterwards discovered it in the middle of the shop. I said, "Why, the meter not connected! look at this. The joints are all sound now." Hann said he had pulled it out. The next day I went to his house about ten minutes after one. He wanted a light. I refused to put up a meter, as the place was very awkward, and Mr. Stone was away. In consequence of plaintiff's solicitation I fixed the pipe from the main. All the joints were soldered. I screwed on the pipe carefully. I did not observe any looseness with the main-tap, nor smell any gas; I tested every joint I made and connected. I went in on my belly to test the main-tap. Plaintiff was present at the time, and held the candle for we whilst I was under the board. I said to him, "Mr. Hann, if there is an explosion I shall be in an awkward predicament." He made some reply, but I cannot say what. I had had some ale and beer that day, but I was not drunk.

Cross-examined by Mr. LOPEZ: We had a pint at Mr. Bussell's in the morning at twelve o'clock. I only remember having two half-pints at Muston's in the afternoon; I had no spirits. I had a glass at Mr. Hann's when I commenced work, a pint more between three of us, and a glass which Mr. Hann gave me when I had finished his work; I will swear that I had no more than another glass of beer. I do get drunk sometimes, but not lately. I was discharged from the Dorchester Gas-Works for drunkenness. I was discharged from Wareham Gas-Works, but was not told for what. I cannot say whether it was for drunkenness. I was not drunk day after day, and cannot say how many times in a week. I took away the meter on the 3rd of August, and turned off the gas, and I remained so until the 28th. Mr. Stone is manager of the Weymouth works. There was only a lad in the office, who said he thought I had better go to Mr. Hann's house. I look to a lad in the office for orders when the manager is away. I sometimes carry a soldering-iron in my basket, but not always. I was not kept in the shop in Mr. Church's time, and not allowed to go out, on account of being drunk. Hadley was not substituted in my place; there have always been two fitters. I tested the joint around the main-tap and others as well. It requires care to test the joints properly in the position the meter was placed. I cannot say whether the pressure on Saturday night would be 18/10ths.

Re-examined by Mr. COLE: I was at Wareham about 12 years ago. I have been working for the old and new companies at Weymouth for about three years. I have had no complaints against me since I have been with them. Mr. Stone has cautioned me not to drink. I was 15 years at Dorchester as a fitter.

George Atkins, examined by Mr. PINDER.

I am a labourer in the employ of the Weymouth Gas Company. I remember going to the plaintiff's house on Saturday, the 29th of August. After the connexions were all made I saw Frampton test them. He laid on his back and applied a lighted match to the main-tap. When the work was done plaintiff said to me, "It is a very good job." When the work was finished he gave Frampton and me a glass of pale ale each. I will swear we were nothing the worse for liquor.

Cross-examined by Mr. LOPEZ: I saw the match applied to the tap. I was kneeling behind him in the stall-board at the time.

Mr. *Robert Oakley*, examined by Mr. COLE.

I am manager of Messrs. Williams's bank, at Weymouth. On Saturday, the 29th of August, I had occasion to send to the gas office. Frampton came, accompanied by Howe, about half-past three. He was perfectly sober then.

Cross-examined by Mr. LOPEZ: Howe went for him because I had a leak in my meter. He found out the leak, and told Howe to disconnect the meter and take it away, as he was about some other work.

George Read, examined by Mr. KINGDON.

I am a gas-fitter at Weymouth. I had a conversation with Frampton about six o'clock on the evening of the 29th. I did not know that he had had any drink.

Cross-examined by Mr. LOPEZ: I talked with him two or three minutes, and then went on.

Joseph Hansford, examined by Mr. PINDER.

I saw Frampton on the evening of the 29th, at the White Hart. This was about seven o'clock. Frampton was then as capable of doing a day's work as I was.

Charles Torpey, examined by Mr. KINGDON.

I am foreman of defendants works. I was at plaintiff's premises on the night of the explosion. I examined the main-tap about a quarter of an hour afterwards. No gas was escaping from it. I tried the tap to see if it was turned off, and then put my nose around the tap.

Mr. *James Russell*, examined by Mr. KINGDON.

I am an ironmonger and gas-fitter at Weymouth, and have been so for 30 years. On Monday morning I visited plaintiff's premises, examined the pipes, and found them properly soldered. The tap was gone then. I could not form an opinion as to what the cause of the explosion was.

Cross-examined by Mr. LOPEZ: I am a small shareholder of the company.

Mr. *Thomas Dodson*, examined by Mr. COLE.

I am a builder at Weymouth, and was instructed to clear away the rubbish on Monday morning. In the progress of this work the service pipe was cleared away. I saw the tap before it was sealed. I saw Mr. Woodcock unscrew the tap-junction and hold it up in his hand. He said, "Here is the cause of the explosion." I did not try the tap.

Cross-examined: I had to wait some time expecting Mr. Tizard. I went to the gas office twice for him, but he said he should not send any one, as he did not feel interested in the matter. I went to the house on behalf of the insurance company. The tap was loose, and evidently not fixed properly, because Mr. Woodcock had previously had it in his hand. I saw Mr. Howard seal up the pipe.

Re-examined: What Mr. Woodcock complained about was the tap, not the joint.

Mr. *Thomas Stone*, examined by Mr. KINGDON.

I am manager of the Weymouth Gas-Works. Frampton has been in the service of the company for 18 months. I have always found him a skilful and good workman. The meter taken away on the 3rd of August had been fixed for about eight months.

No other witnesses were called for the defence.

Mr. COLE, in reviewing the evidence, alluded at some length to the alleged intoxication of Frampton, and contended that he had shown by the most respectable witnesses that the man was in a sober state on the afternoon in question. There was Mr. Howard, who lived at Weymouth, than whom a more intelligent and acute gentleman in the profession did not exist. He (Mr. Cole) had no doubt the jury knew him. A man more competent to get up a case he did not know. If he (Mr. Cole) had a case, the value of his services would be inestimable. He lived at Weymouth, was on the spot, and had been tracking Frampton; but all he could show, with all his industry, all his skill, and all his care, was the fact that Frampton had three pints of beer between him and the other man during the day. Mr. Cole then reviewed the evidence relating to the sobriety of Frampton, and asked the jury if they could doubt but that he was perfectly sober at the time stated. Mr. Cole stigmatized the possession of Hann's premises by the police as a farce, and said that there was every reason to believe that many persons had been tampering with the tap before it was sealed up. From the cross-examination of one of the witnesses by his learned friend a most triumphal fact had come out. It came out accidentally that the story of the man, Woodcock, was started for the first time after he had heard the evidence of Howe, and it was an entire afterthought. If there was a leak in the tap, he (Mr. Cole) contended it was caused by people shaking it on Saturday night and Monday morning. Alluding to the supposed cause of the accident, Mr. Cole said it might be that, when the accident occurred on Friday night, some of the piping was injured; and his learned friend had suggested that, when the pressure was put on on Saturday night, the accident occurred. If that was so, it proved the case for defendants. They could not be made liable unless carelessness as shown. Supposing that, when Frampton tested the pipe, there was not sufficient pressure, and he could not detect an escape, then, in point of law, defendants were not liable for latent effects. This had been ruled over and over again, that when there was nothing to call the attention of a person to any defect, and he used proper care and caution, the jury always found that the plaintiff could not recover. In support of this, he alluded to the case of *Knight v. Yearsley*, tried at the assizes, where an action was brought to recover damages owing to the breaking of an omnibus wheel. It was shown that the state of the spokes was such that defendant's attention had not been called to them, and he received a verdict. He maintained that, unless there was negligence on the part of Frampton, or some defect in the pipe, the defendants were not liable. He admitted that every one let for hire was bound to bring to his work competent skill and care, which he maintained were used in this case. It was clear there was no escape when Frampton was in the stall-board. Dr. Odling was a man of considerable ability, but it was a curious thing that when before the coroner he made use of this remarkable expression, "I am not satisfied that the leakage was from the tap." How could he reconcile that evidence with what he had now given? As a scientific man he was competent; but when he (Mr. Cole) came to deal with mechanics, he would rather have to deal with Howe, and say there was no leak at all in the tap. In conclusion, Mr. Cole remarked that he was certain the jury would not be led away by prejudice, but that they would look at the case as men of the world, not heeding on the one side the poor man who had suffered from the effects of the accident by the loss of his stock, for his house was insured, nor on the other the company, who were bound to protect the pockets of the shareholders if they thought they were not liable.

Mr. LOPEZ, in reply, congratulated the jury upon having arrived at the termination of this lengthened and somewhat tedious case. He felt he should best show his appreciation of the attention they had bestowed on the mass of evidence he had brought before them, by endeavouring in the observations he had to make, to render them as clear and short as possible; in fact, to deal with the salient points of the case only, without entering into a quantity of minute facts. He had stated, at the commencement of the trial, that it was an important case, and he did not believe the jury would charge him with having spoken incorrectly when he used that expression. It was a most important case to plaintiff, and not only to him, but most important to the public at large, because it was essential that companies like the defendants, in whose hands were entrusted half the lives of the population, should learn the nature and character of the responsible duties they had to discharge, and if by chance they should fail in carrying out those duties, a jury should oblige them by their verdict to make compensation. Before he proceeded to deal with the facts of the case, he would say that he regarded the result of this action with the greatest anxiety. Impressed with the importance of the case, he could not be struck at the formidable array of counsel the defendants had thought fit to oppose against himself and his friend Mr. Collins, from whom he had received the most valuable help. But he must say the facts in this case were so strong that he did not fear for the result. He could not, however, refrain from saying that the case had not been conducted, with respect to his client, with that good temper that might have characterized it. He would now draw their attention to the law, as he presumed it stood, subject, of course, to his lordship's correction. Every person who held himself out as competent to discharge certain duties for reward was bound to bring to the discharge of those duties proper competence, proper care, and proper judgment; therefore, if defendants had shown any default in any one of these matters, they were liable to pay the compensation which plaintiff sought. Before he proceeded to deal with the facts of the case, he might be allowed to sweep away some of the cobwebs with which his friend, Mr. Cole, had been pleased to invest the case. He had complained of the scientific witnesses introduced into this case. He had said that scientific witnesses were most dangerous advocates, coming prepared to support any theory to suit the side for which they might be called. He (Mr. Lopez) thought that was a most unjust observation. During his experience at the bar he had received the greatest assistance in cases where scientific gentlemen had been engaged. As a rule these gentlemen gave evidence with very great caution, and with every desire to do justice between all parties, and he thought that observation would be applicable to the scientific gentlemen whom he had called. He did not think he should have exercised the judgment that would be expected if he had attempted to point out how the explosion occurred. It was enough for him to show that it actually happened. It was sufficient for him to point in the direction as to what caused the accident, without placing his finger on the very point, and saying, "This caused it." He then rebutted the arguments used by Mr. Cole as to the cause of the explosion, and proceeded to say that he would not impute anything against the company for defending this action. He commended them for so doing, if they considered they were not liable. Seeing Mr. Penny, the company's engineer, present, he was surprised that when he (Mr. Lopez) placed two scientific witnesses to give evidence of a most material character he was astonished to see that gentleman (Mr. Penny) sit still, and not seek to impeach their testimony. The defendants not having done this, the jury were bound to believe every word uttered by Dr. Odling and Mr. Spice. Mr. Cole had said he was much obliged to him (Mr. Lopez) for suggesting that the extreme pressure might have broken the pipe on Saturday night, but he forgot another observation, that on the Monday following, when the leak was tested, there was no extreme pressure. He did not dispute that Frampton was a competent man, but what he said was, that he was not in a fit state to perform his duties on the Saturday night when the explosion occurred. He (Mr. Lopez) asserted that the leakage was in the tap, and it was certain that that part of the house immediately above the tap would be most affected by an explosion from that quarter. The tap was in front of the house, where the force of the explosion was exerted. The floor was also blown up, and that was consistent with his argument. They had seen Frampton in the box, and after seeing him did they think he was a man to get drunk? Frampton said he was discharged from the Dorchester Gas-Works four years ago, and at a more distant period from Wareham. He (Mr. Lopez) did not know if the defendants were aware of his character when they engaged him. He might now venture, with these observations, to leave the case in the hands of the jury. He would, however, call their attention to the fact that the plaintiff had not been guilty of any contributive neglect. There was not the slightest doubt but this company had in view that other claims might be made upon them in defending this action, but that was no reason why plaintiff should not obtain the remuneration to which he was entitled. He asked the jury, for the sake of the plaintiff, in the interests of the public, and in the interests of justice, to pronounce by their verdict that plaintiff should have compensation for the injury done to his house and property. He was a poor man, dependent on his own exertions for his bread. The question of damages would be settled elsewhere, so that he did not purpose to touch on that point. Plaintiff's house and stock in trade had been destroyed; he had been prevented from carrying on his business, and had been obliged to go under medical treatment, and he was therefore entitled to a verdict in this case. The question they had to decide was, whether the defendants were liable or not.

The JUDGE, in summing up, said the whole issue of the case was, whether this explosion was caused by the negligence of defendants workmen. With respect to the damages, the learned counsel for the defence had suggested, and the counsel for the plaintiff had acceded in, a proposition that this should be referred to some person to say what in law, justice, and fairness ought to be a fair and proper sum to be awarded as compensation. But, before they could do that, the jury must be satisfied that the defendants were liable. They knew nothing of the plaintiff to his disadvantage. Whenever a fire occurred or an explosion took place, a certain amount of suspicion was apt to be caused; but in this case plaintiff had just built a house and insured it, but the insurance was not sufficient to pay for the cost of rebuilding; whilst, with respect to his stock and furniture, that was uninsured. Therefore the plaintiff, so far as they could judge, had the greatest possible interest that no fire should happen, and he came into court with clean hands. He (the judge) recollected, however, this fact, that he was behind with his gas bills. His lordship then briefly alluded to the evidence, after which he asked whose fault was the accident. Was it the fault of the company? He agreed with Mr. Cole that it was for the plaintiff to satisfy the jury that it was the fault of the company, by their workmen. Evidence had been brought to show that Frampton was drunk, and that he was impatient at being kept at work so late. The defendants said that Frampton was a skilful workman, and there was a great deal of reason for saying that he was so. He saw no reason to reflect on his skill. They further said that he was not drunk. Let the jury look at the cross-examination of Frampton, and say what they thought about that. He would read it over if they liked.

A JUROR: We do not want that.

The JUDGE: There was a former explosion, and the defendants say this might have shaken the meter and displaced the tap. But some observations could be made on that. Frampton was engaged in repairing the effects of the first explosion, and if it had displaced the meter and tap, it was his business to have put them right. The question was, whether he was a careful and sober man, and, with unlimited time at his disposal for remedying any defects, had not done so. Defendants counsel were obliged to admit there was a leakage caused by some means, but where it was only conjectured, no satisfactory proof being given. The simple question for the jury to decide was, whether the explosion was caused by the negligence of defendants workmen. If so, they would find for the plaintiff; if not, for the defendants; but the plaintiff must satisfy them that it was.

The jury, after a deliberation of a few seconds, found for the plaintiff.

The announcement was received with a slight demonstration of applause, which, however, was immediately ordered to be subdued.

CARDIFF POLICE COURT—MONDAY, MARCH 8.

(*Before* R. O. JONES, *Esq.*, *and* A. BASSETT, *Esq.*)

SAMUEL *v.* THE CARDIFF GAS COMPANY.

In this case, *Lewis Samuel*, a photographer, of Bute Road, summoned the Cardiff Gas Company for refusing to supply him with gas after receiving the necessary application to do so.

Mr. SOLOMONS appeared for the complainant, and Mr. R. E. SPENCER for the gas company.

Mr. SOLOMONS stated that the proceedings were taken under the 34th section of the gas company's Act, and this clause stated that the gas company shall, at the request of any owner or occupier of any premises within 25 yards from the company's mains, furnish such owner or occupier with gas, and that the company refusing or neglecting to supply such person with gas rendered themselves liable to a penalty not exceeding £5. The plaintiff in this case called at the gas-works and requested to be supplied with gas, but this was refused on the part of the company unless the complainant deposited the sum of £2. The 35th clause of their Act enabled them to charge a reasonable sum for the hire of a meter, but there was no mention of a deposit being paid previously to the supply of gas.

Complainant was then called, and stated that he occupied the premises, 193, Bute Road. He applied to the gas company to be supplied with gas before last Christmas, and on the 23rd of last February he made a written application to the company. He afterwards saw one of the clerks at the offices, who refused to supply the gas unless a deposit of £2 was first paid. He refused on the ground that the demand was unreasonable, but offered £1, the same amount as had been deposited by his predecessor. He had since seen Mr. Bowen, the company's manager, but no gas had been supplied to him in answer to his application.

In cross-examination complainant said that he paid 23s. a week for rent of his premises, which were opened as a photographic establishment.

Mr. SPENCER, for the company, relied on the latter portion of the 44th section of the Act, which enabled them to supply gas on such terms as they might think fit. It was the custom of the company to require from strangers a deposit equal to a quarter's rent. The sum required in this case was not unreasonable, as there were five burners, and the previous tenant had deposited the sum of 30s., but the company were in the end considerable losers, and therefore in adopting this course they were only taking such measures as would protect themselves from loss. The question for the bench to consider was whether the company had a right to this deposit before supplying the gas. This had been their invariable practice, where they were unacquainted with the parties, and deposits of this nature had been made by the gas consumers in considerable numbers.

Mr. JONES was of opinion that the 43rd clause gave the company a right to do a great deal more than the general tenure of the Act, as it referred to agreements between the gas company and parties, companies, or corporations, relative to the supply of gas by special agreement. The company could charge a reasonable sum for the use of the meter, but he did not see, from the reading of the clause, that they had any right to refuse to supply the complainant with gas.

Mr. SPENCER: We have a right to demand payment in advance.

Mr. JONES: No; I do not see that. The 44th clause enables you to make agreements for particular purposes, as it might be convenient to supply certain parties with gas at a less price than the general charge; but that is the consequence of the agreement between the company and the parties under this clause. That is, however, not a compulsory measure, but one depending on the agreement of the parties themselves; and I cannot see that there is any power in this clause for the company to insist on a deposit being made from parties who require gas to be supplied to them, provided there is no agreement between them to that effect.

Mr. SPENCER contended that the Legislature, in making the supply compulsory, could only intend to make it compulsory on certain terms. If the company were compelled to supply their goods, they could not surely be made to supply them except on their own terms. The company could not be asked to give away their own property, without naming some reasonable terms to protect themselves.

Mr. JONES: By the 45th clause you can recover by distress.

Mr. SPENCER: We have no power except we come before your worships. The view taken by the gas company is a correct one, in support of which I have several cases in point to refer, and unless I felt that I was correct I should not press the matter so strongly. Cases have not only been decided in our favour in the superior courts, but similar cases have also been tried in the county court.

Mr. *Bowen*, the manager of the gas-works, was called, and stated that the quarter's rent for gas for such premises as the complainant had would amount to about £2 10s. The predecessor of the complainant had consumed gas to the amount of £2 14s. in one quarter, and the same gas-fittings remained. In this case a deposit of £2 was required. It was usual to require a deposit equal to about one quarter's rent. The company supplied gas to about 2000 houses in Cardiff, and the occupiers of a number had paid deposits.

After a short consultation, Mr. JONES said the bench were of opinion that the company were bound to furnish gas to the complainant. According as they read the clause, the complainant had done all that was required of him by the Act, and the company having neglected to supply him with gas, had rendered themselves liable to the penalty pointed out in the Act. The 44th clause, in their opinion, related to agreements between corporations and other parties with the company upon terms mutually beneficial, but it did not enable the company to impose terms upon persons requiring to be supplied with gas, but with whom there was no special agreement. The 35th clause enabled the company to charge a reasonable sum for the use of the meter, and such sum could be recovered in the same way as gas-rent. They considered that the company had rendered themselves liable to the penalty, and they should inflict a penalty of £1 and costs. In the absence of any decisions of the superior courts, there were no materials or arguments on which to form their opinion, but from the information they had at their command they were bound to arrive at the decision they had done.

Mr. SPENCER asked for a case, and said that there had been several decisions in their favour in the superior courts, in cases precisely analogous to the present one.

Mr. JONES adjourned his decision, to enable Mr. Spencer to lay before him the cases to which he had referred.

The case came before the magistrates again on the following Wednesday, when Mr. SPENCER, for the company, called the attention of the bench to the case of *Hazlewood v. Hoddesdon Gas Company*.

Mr. JONES said his attention had already been called to this case, but there was nothing in it. In the Swansea Act there was a special clause to enable them to recover from the next tenant; but in the Cardiff Act there seemed to be no particular clause of this kind.

Mr. SPENCER said their contention was that they should supply gas to parties on reasonable terms.

Mr. JONES: And the reasonable terms are laid down in the Act, at a certain charge per cubic foot.

Mr. SPENCER contended that they were only a trading community, and supplied their goods on the reasonable terms on which other persons would supply their goods.

Mr. JONES: You are bound to furnish everybody with gas at a certain price.

Mr. SPENCER thought they were not bound to part with their goods unless they chose to do so.

Mr. JONES was of opinion that they must, but they could demand payment the next day if they liked.

Mr. SPENCER felt quite at a loss to conceive the object of the 44th clause unless it was to grant the protection which the company contended that it did grant. By this clause he thought the consumer was bound to tender money before the gas was supplied.

Mr. JONES: It does not seem so to me.

Mr. SPENCER: It seems to me that the gas must be supplied, subject, of course, to reasonable terms, and those terms being within the meaning of the Act.

Mr. JONES: You are bound to deliver the article on application. You can then proceed to recover the money.

Mr. SPENCER: If that is the construction of the clause, then any pauper or bankrupt could come and demand to be supplied with gas, and the company have not the slightest security to protect themselves. Surely that is in itself so unreasonable, that the Legislature could never sanction such a state of things. If this was the true construction, it was unreasonable to all parties, for the company were bound under a penalty to supply the gas—to part, in fact, with their property—without the slightest protection to themselves.

Mr. JONES: You can go the next day and demand payment.

Mr. SPENCER pointed out the trouble and inconvenience to the parties themselves, as well as the gas company, and also the expense. Their only mode of proceeding, in the event of a person refusing to pay, was to cut off the supply; perhaps to be renewed the next week to some fresh person, and to be again removed in a short time.

Mr. JONES: We do not say anything about the inconvenience, but we do not see any reason to alter our decision of Monday. We think that the company were bound to supply this man with gas, and for their neglecting to do so we inflict a penalty of 20s. and costs.

Mr. SPENCER applied, on the part of the gas company, for a case, which was immediately granted.

Miscellaneous News.

CITY OF MOSCOW GAS COMPANY, LIMITED.

An Extraordinary General Meeting of the Shareholders of this Company was held at the Terminus Hotel, Cannon Street, in the City of London, on Wednesday, March 10—J. S. GODFREY, Esq., in the chair.

The SECRETARY (Mr. H. C. Wiss) having read the notice convening the meeting,

The CHAIRMAN said: Gentlemen, I am sorry to have to inform you that since our last meeting the total subscriptions to the proposed new issue of mortgage debentures amounts, in cash, only to £39,260. I need, therefore, hardly say that there is little hope of our being relieved from our difficulties by the issue of those debentures. The circular which has been sent to you has informed you of what took place immediately after the last meeting, and the position in which we were placed at the date of that circular—viz., that a petition had been presented to the Court of Chancery for the purpose of winding up the company. Since that time, as we are informed, another petition has been presented by other parties. With that petition we have not yet been served; but we know as a fact that it has been presented, and that it has been advertised. Under these circumstances, it appears to us that the only alternative is to pass a resolution for the voluntary liquidation of the company. I saw one of the large shareholders in the company this morning, who was very anxious that some further steps should be taken to raise funds for the purpose of getting the company out of the difficulties which surround us, and to avoid the necessity for a voluntary winding up. Well, gentlemen, I can only say that the step we propose would not hinder such a course being taken, but would, in fact, facilitate the matter. If we get into a compulsory winding up, there will be great difficulty in getting out of it; whereas, if we adopt the other mode of proceeding, and the money can be found, there will be no difficulty in satisfying our creditors, and getting rid of the voluntary liquidation. I therefore address myself to the advantages of a voluntary over a compulsory liquidation, and upon that point I may be very short, for I suppose there are but few gentlemen in this room who would get into the Court of Chancery if they could possibly avoid it. The expenses connected with proceedings in that court are very great, and the necessary delays, in consequence of the enormous amount of business on hand, would be very injurious to the interests of this company, for it appears to us that the first thing to be done, immediately after the passing of the resolution which I shall propose to you, is for the gentleman who may be appointed liquidator to realize the assets of the company, to sell the concern at the highest price to be got for it, and to distribute the assets. If any long time should intervene before that is done, the value of our business in Moscow would suffer from it, and possibly the price to be obtained for the works would be prejudiced. A voluntary liquidation, therefore, appears to us to have great advantages, both in economy and speediness and in the facility for winding up the concern, over a compulsory winding up. I think I need not say more upon the subject, but may proceed at once to propose the formal resolution required by the Act of Parliament—viz., "That it has been proved to the satisfaction of the shareholders of the City of Moscow Gas Company, Limited, that the company cannot, by reason of its liabilities, continue its business, and that it is advisable to wind it up."

Mr. SAUNDERS (a director) seconded the motion.

Mr. WILMOT KNIGHT: I suppose a resolution will follow this, with reference to the mode of winding up—that is to say, whether voluntarily under the supervision of the court, or compulsorily.

The CHAIRMAN: I ought to have mentioned that we propose to have a voluntary liquidation under the supervision of the court, so that the company will have all the advantage of that supervision without any of the disadvantages and delay of a compulsory liquidation.

Mr. KNIGHT: I do not know whether you quite answer my question. Will another resolution follow this?

The CHAIRMAN: Yes.

Mr. KNIGHT: As you have mentioned the advantages which, in your

judgment, would result from a voluntary winding up, may I ask whether the shareholders who, like myself, have paid £500 for £500 worth of shares, have any interest whatever in the matter—that is to say, is there any prospect whatever of the original shareholders getting anything, no matter how it is wound up, whether voluntarily or compulsorily?

The CHAIRMAN: It is a very difficult question to answer what the assets of the company will realize; but I need hardly say, for every one will see it in a moment, that the more the expenses can be kept down, and the more speedily and advantageously the property can be realized, the greater will be the prospect of the shareholders getting something. I am afraid that a liquidation under any circumstances must be a very unfavourable one for the original shareholders, and I should be sorry to hold out the prospect of their getting any return; but whether they do or not will depend upon the way in which the winding up is conducted.

Mr. ROWSELL thought it very desirable that another effort should be made to avoid going into liquidation, and he repeated the request which he made at the last meeting, for the formation of a committee to wait upon all the shareholders personally, and endeavour to raise subscriptions to the mortgage debentures. It appeared a very simple thing to talk about liquidation now, but he believed the shareholders would be startled and horrified when they came to realize the fact that they were involved in such a proceeding. He hoped, therefore, that some effort would be made to save the company. He had heard on good authority that the concession was not a bad one, and, though there was a loss on the supply of gas to the public lights, that loss could only be looked upon as the price or penalty paid for the exclusive privilege of the private lighting. No doubt the shareholders had much to complain of as to the management of their affairs in the past, which he was afraid would all have to be gone into if the company went into liquidation; but with regard to the present management, he believed no one had anything to say against it. Under all the circumstances, he did not see why the shareholders should be so utterly disheartened as to give up all hope of resuscitating the concern; and, in order to test the feeling of the meeting, he proposed as an amendment—"That a committee of shareholders and debenture-holders be appointed to confer with the directors on the whole position of the company's affairs; that this meeting be adjourned till this day month, to enable the committee to present a report, with suggestions as to the wisest course to be adopted."

Mr. H. C. HUNT seconded the amendment, but expressed an opinion that it would be no use persisting in it unless those persons who had presented petitions to wind up the company were willing to allow legal proceedings to remain in abeyance while the proposed committee were deliberating upon the course they would recommend. If those gentlemen could be induced, upon the payment of a proportion—say 25 per cent.—of their claims, to allow the remainder to stand over, they would still retain their security, and, indeed, improve it; and the only question would then be whether they would lower their rate of interest from 12 per cent. to 5, so as to meet the present net revenue of the company.

The CHAIRMAN said he might remind the shareholders who had just spoken that the adoption of the original motion would not preclude any action on the part of the shareholders to raise the money required for such a purpose as had been indicated. But it appeared to him to be indispensable that the resolution to wind up voluntarily should be passed, for this reason—they had not only to consult Messrs. Gibbs and the other persons, both of whose petitions stood for the following Saturday, but if they went to the court and said they intended to raise the money, the court would not stay its hands, but would at once make the order to wind up compulsorily; whereas, if they could state that they had passed a resolution to wind up voluntarily, the great probability was the court would grant an order to that effect. It would then be competent for any shareholder to take steps to get the concern out of litigation. As to whether any measures other than those adopted by the directors could be devised, he was unable to say. They had sent circulars round to the shareholders, and they had had communications with the International Financial Society since the last meeting; and in reference to the remarks of the last speaker, he could assure him there was not the slightest chance of getting the International to accept 20 or 30 per cent. of their debt, and reduce the rate of interest, as he had suggested they might do. Nor was it likely that persons would come forward to subscribe to the mortgage debentures to any great extent for that purpose, under present circumstances, knowing as they did that, the International loan being still in existence, that company could, at any moment, come down and sweep away the whole of the property to meet their claim. It was hopeless to do anything unless the sum necessary to clear off the whole of the liabilities could be raised.

Mr. HUNT said his idea was that perhaps if the International Society could receive a cash payment of 25 per cent. they would allow the remainder of their claim to stand over for a period of, say, five years.

Mr. KNIGHT said any negotiation of that kind could be carried on as well after the passing of the resolution as before.

Mr. SCHUSTER said he should not vote for a voluntary winding up unless he were assured that as searching an investigation into the affairs of the company would be made as would take place under a compulsory liquidation. He thought such an investigation was imperatively called for, looking to the enormous losses the shareholders had sustained.

A PROPRIETOR said he thought one of the advantages of a voluntary winding up was that the company could nominate their own liquidator. He inquired who the persons were who had presented the second petition.

The CHAIRMAN: Messrs. Oxenham, who are debenture-holders.

Mr. H. GIBBS said, before the resolution was put, he would like to make one observation. The shareholders were aware that he had presented a petition to wind up the company, and he thought he need hardly assure them that it had been done, not from a hostile spirit towards them, but solely for his own protection. In presenting that petition he believed he had done that which was right for the protection of the interests of both parties. He must confess he was exceedingly sorry the shareholders had not come forward as he hoped they would, and as he had himself set them the example of doing, so as to pay off the debts of the company, because, as he told them when he last addressed them, he believed there was a future of good and profitable results for the Moscow Gas-Works. But the shareholders had chosen not to do so; and, therefore, looking at the small sum which the chairman stated had been subscribed, it was utterly impossible the concern could go on, unless some such organization as that suggested by Mr. Rowsell were successfully carried out. He was afraid even that would be very difficult. But what he rose for was to tell the meeting how he proposed to act. He thought, seeing that he was the petitioner against the company, it did not become him to vote for the resolution, or to say whether the winding up should be voluntary or compulsory, and therefore he should sit quiet; and, when the shareholders had settled that amongst themselves, he should be prepared to take his own course in the matter.

Mr. ROWSELL, seeing the opinion of the meeting was in favour of the resolution, deemed it useless to talk about making any effort to raise the necessary funds. No one, under such circumstances, would come forward to subscribe, and therefore he withdrew the amendment. He hoped that, when the resolution was adopted, and they came to consider the question of the liquidators, some addition would be made, because he thought it was hardly right that the interests of other parties in the company should go without any protection.

The resolution was then put, and carried *nem. dis.*

The CHAIRMAN moved—"That the company be wound up voluntarily, subject to the supervision of the court."

Mr. DYSON seconded the motion, which was put, and carried.

The CHAIRMAN said the next resolution was for the appointment of liquidators, and the first question was, how many there should be. It was said that "in the multitude of councillors there is wisdom," but this must be taken *cum grano*, and on the ground of economy it would be well not to appoint too large a number. The directors did not intend to propose any one, and it was to them perfectly indifferent upon whom the choice of the shareholders fell, as they had endeavoured faithfully and honourably to fulfil their duty; and, having themselves nothing to conceal, they would be only too happy to have the most searching investigation.

A PROPRIETOR asked whether the directors would themselves act as liquidators. He believed it was the only chance the shareholders had of getting anything out of the concern.

The CHAIRMAN said the directors left the matter entirely in the hands of the shareholders.

Mr. HUNT thought it would be desirable to have more than one liquidator, and he nominated Mr. Rowsell.

Mr. J. MUTTLEBURY considered it would be advisable to have two liquidators. One of them, he thought, should be the chairman of the company, if he would consent to act in that capacity; the other should be an experienced accountant. The shareholders would thus secure in the appointment the advantage of a practical knowledge of the affairs of the company, with the professional skill necessary for the important duties to be discharged. The accountant he would name was Mr. Arthur Cooper, of the firm of Cooper Brothers, well-known accountants in the City of London. On the score of £ *s. d.* he had no hope of any successful result to the shareholders, but as a matter of curiosity, and not for the sake of gratifying any revengeful feeling, he would like to know how the concern had failed—whether through simple mismanagement, or whether the shareholders had been swindled.

Mr. MUTTLEBURY then proposed that the chairman be one of the liquidators.

Mr. KNIGHT seconded the motion with great satisfaction. The chairman had given a vast amount of attention to the affairs of the company, and would not allow any concealment with reference to past transactions. For himself, he hoped all those dealings would be brought to light, and from a long experience in the Court of Chancery he might state that in a voluntary liquidation there was as great facility for a frank *exposé* as there was under a compulsory winding up.

Mr. ROWSELL said as his name had, without any previous intimation, been proposed to the meeting, he should like to say that he cordially supported the nomination of the chairman, whose election he believed would be the wisest thing the shareholders could do.

The resolution was put to the meeting, and carried unanimously.

The CHAIRMAN said it was his duty to acknowledge the kindness with which the mover and seconder had spoken of his services, and to thank the meeting for the honour done to him in appointing him one of the liquidators. Up to the present time his experience of the company was not such as to induce him to take any further responsibility, for though the duties of the directors had been very onerous, they had received no remuneration for it; but as the shareholders had elected him, and he probably knew as much of the affairs of the company as any one, having served on the committee of investigation and at the board, for the last twelve months, he trusted that he should be able to serve their interests as well as any one. And he hoped that if (as unfortunately he was afraid would be the case) he was not able to do anything in the interests of the shareholders, and that they came to be sacrificed to the interests of the creditors, they would remember the kind expressions with which they had invited him to take the office, and that they would believe the result was not owing to a want of ability and exertion on his part to assist them.

Mr. CUNNINGHAM moved the appointment of Mr. Alfred Cooper as the second liquidator.

Mr. SCHUSTER seconded the motion, and said he was desirous of urging upon the gentlemen appointed as liquidators the duty of laying before the shareholders all the facts and figures which might result from their investigations. He felt that he had lost his money in a way which was not right. He went into this concern not as a speculator, but as an investor, and he looked upon the collapse of a gas company, under existing circumstances, as a thing altogether unparalleled.

Mr. PEILL suggested that Mr. Kemp, who had acted as an auditor of the company, would be the fittest person to be appointed the second liquidator; but the suggestion was not favourably received by the meeting.

Mr. SCHUSTER said Mr. Alfred Cooper was the liquidator nominated by Mr. Gibbs under his petition. Mr. Gibbs had shown himself a great friend of the company, and he thought the shareholders should show confidence in him by thus supporting his nomination.

The motion was put, and carried unanimously.

The CHAIRMAN said that closed the business of the meeting. In reply to the inquiry which had been addressed to him, he apprehended it would be the duty of the liquidators to go into every matter connected with the past history of the company, with the view of obtaining the return of anything that could possibly, under any circumstances, be reclaimed.

Mr. SCHUSTER expressed a hope that an account would be given of the £56,000 which, on a former occasion, the chairman stated the directors had been successful in obtaining. It would be remembered that there was an addition to the contract of £62,000, of which the directors obtained the return of £56,000. He would like to know who repaid that money—out of whose pocket it came.

The CHAIRMAN said this being the first occasion on which he had acted as liquidator, his experience was very limited, and in what he did he must be guided by the greater experience of Mr. Cooper. But, so far as any investigation could be made, he should feel it his duty to make it, and, as far as it was possible, to obtain back any moneys that might be due to the company. Whether it was the duty of the liquidators to investigate any matters simply for the purpose of an exposure, without the ultimate object in view of getting money back, he was not prepared to say. If it was his duty he would not shrink from it.

Mr. SCHUSTER said he knew, from private information, that £89,000 was added to the contract for the construction of the works. Of that £89,000, the sum of £27,000 was paid to the sub-contractor, leaving a sum of £62,000,

of which the directors recovered £56,000. He should like the shareholders to know who it was that refunded it.

Mr. CUNNINGHAM supported the request, and hoped Mr. Godfrey would tell them, not as liquidator, but as chairman of the company, from whom it came.

The CHAIRMAN said he had no hesitation in telling the meeting. It came through the brokers of the company. The directors entered into the compromise with the distinct understanding that their mouths were not to be shut, and that if called upon they should be at perfect liberty to say from whom the money came.

Mr. CUNNINGHAM said, in justice to the brokers, he should like the chairman to say whether they disclosed at that time for whom they paid that money.

The CHAIRMAN: No.

Mr. CUNNINGHAM: Did they pay it as individuals, or did they disclose the names of their clients?

The CHAIRMAN: They certainly did not disclose the names of the parties for whom they paid the money.

Mr. CUNNINGHAM: You do not know?

The CHAIRMAN: We do not know, but I believe they consider they have a claim over other parties for the money; but of that we know nothing. The arrangement was with them, because they were the parties through whom Smith, Knight, and Co. paid the money. I should mention that, with regard to a portion of it—£9000 and upwards—it never went into their hands. That was obtained from Mr. York, in bonds of the company when we settled with him.

Mr. SCHUSTER: I ask, sir, do you know or do you not know whether your predecessor in that chair was properly qualified or not?

A PROPRIETOR: Whether he was not the nominee of some one else?

The CHAIRMAN: I believe he was properly qualified. I have no personal knowledge in the matter, but I have looked through the register of shareholders and the dates of the payments of the calls, and I find that he is credited from time to time with the amounts due on his shares.

Mr. SCHUSTER: Was a qualification given to him to take his place at the board, and, when it was found out, did he go and qualify?

Mr. WEBB said it fell to him to negotiate with the brokers of the company respecting the £62,000. They came forward in the most ready way, and said that, as they were the nominees of the recipients of the money, and their names had been mentioned in association with them, they would draw a cheque for any amount that was due to the company. The qualification of the late chairman came from that money, but, after it was discovered, the money was recouped.

A PROPRIETOR: For further information inquire within.

Mr. KNIGHT hoped that all these transactions would be fully investigated, if only for the sake of purifying the joint-stock atmosphere.

Mr. ROWSELL asked whether the directors had formed any idea at all as to the mode of disposing of the property. In his opinion, by far the wiser mode of proceeding would be to endeavour to form a new company; and, if so, the sooner it was set about the better.

The CHAIRMAN said there was no arrangement or organization for the purpose of forming a new company, but the directors in conversation had spoken of the matter. It would be the duty of the liquidators to obtain the highest price they could for the concern, and probably in that way it would be most readily done.

Mr. CUNNINGHAM asked whether, the company being in liquidation, the International would be prevented from selling the works, as they threatened.

Mr. WEBB said the International could do nothing for three months, but he did not apprehend any action would be taken by them to frustate any arrangement that might be made.

A PROPRIETOR said he was told by the late Sir Emerson Tennent that the municipality of Moscow had offered half a million for the works of the company.

The CHAIRMAN said he had not heard of any such offer. With reference to the suggestions made by several speakers, he could only say that he should not shrink in the fulfilment of his duty, nor avoid any investigation which might seem necessary in the interests of the shareholders. From all the information he at present possessed, he did not think it possible to obtain any restitution of the funds of the company. In fact, the money had been simply dissipated—lost in mismanagement—and he would give a few figures to show how it had gone. The directors commenced with a subscribed capital of £625,000; out of that they had to provide £56,000 as caution-money, which was at once locked up. They then entered into a contract for the construction of the works at £653,000, which was £78,000 in excess of the money in hand. Then, further, in consequence of misrepresentations as to what the business would require, they entered into a contract for the purchase of coal to the extent of about £40,000, and of fittings to the extent of about £80,000. They paid to the concessionaires, under the terms mentioned in the prospectus, £25,000, and they paid interest to the shareholders £35,000. The other expenses—salaries, directors fees, wages, the costs of commencing operations, loss of gas, &c.—brought up the total amount to £900.000, and they had only £625,000 to meet it with. The directors, at the latter end of 1866, found themselves in that condition. The rate of interest at the time was such that it was considered useless to call the shareholders together in the hope of finding the money, and fearful that the state of affairs would become exposed, and the position of the company jeopardized, they borrowed the money on the best terms they could. Those terms were very exorbitant, but probably, under the circumstances, no better were to be had; still, the first deficiency of £300,000, and afterwards the payment of the high rate of interest, fully accounted for the collapse of the company, without supposing there had been any misappropriation of the funds.

Mr. PEILL said if the directors had issued the remainder of the shares when they had the opportunity of doing so, all this would have been avoided. The failure to do so was their great mistake.

The CHAIRMAN said there was no doubt such was the case.

A vote of thanks was then presented to the chairman, and the proceedings terminated.

METROPOLIS GAS SUPPLY.

METROPOLITAN BOARD OF WORKS—FRIDAY, MARCH 5.

At the Meeting of the Board this day—Sir JOHN THWAITES in the chair,

The CHAIRMAN said: I suppose every member of the board has received a copy of the applications for the appointment of gas examiner. I do not know what course the board will take with regard to the matter, but it is quite clear you cannot proceed with it to-day. You must see the parties, and the question is when you will proceed with the election. I understand there are very few candidates—only twelve—so that the matter need not be referred to the committee for the purpose of reducing the number. But it is desirable that you should see the candidates, because a very important principle is involved, and it is necessary that we should ascertain whether the gentlemen are really acquainted with the fact that they will have personally to discharge the duties of the office—a point which I believe the board regard as a *sine quâ non*.

Mr. NEWTON moved that the matter be referred to the Gas Committee.

Mr. ROGERS seconded the motion. The board, in their advertisement, had distinctly stated the terms upon which the appointment would be made, and with reference to one celebrated person who was a candidate he believed it was perfectly understood.

The CHAIRMAN: The question is not referred to the committee for the purpose of reducing the number, but that they may see the candidates and make a report to the board.

Mr. RICHARDSON: Is not this matter affected a little by the letter received from Mr. Bright, that it is not intended by the Government to proceed with a bill for regulating the metropolis gas supply this session?

Mr. ROGERS: That does not affect the matter at all.

Mr. RICHARDSON: But are we obliged to make an appointment at all?

The CHAIRMAN: We are under an obligation to do so.

Mr. RICHARDSON: It is an obligation we need not regard.

Mr. ROGERS: We are under statutory obligation.

Mr. RICHARDSON: The appointment cannot possibly be of use.

The CHAIRMAN: That is not for us to determine; it is a duty cast upon us to perform.

Mr. H. L. TAYLOR: No doubt the gas companies would be quite willing that a gas examiner should not be appointed; but I think it is not only our duty to do it, but that it will be £100 a year well spent.

Mr. TURNER: I should like to know whether it is understood upon what day the appointment will be made.

Mr. NEWTON: This day fortnight.

Mr. TURNER: Shall we not have a report on the subject this day week?

Mr. NEWTON: I think possibly we may be able to make a report this day week, but the election was fixed, last Friday, for that day three weeks.

Mr. TURNER: The report will guide the members of the board.

Mr. BIDGOOD: But what I should like to know is, there being only twelve candidates, what the committee have to report upon. If they are authorized to reduce the number, they will have something to do; but if they are simply to see the twelve persons—if the committee are to see them, and we have to see them afterwards—what possibly can be the use of referring the matter to the committee?

Mr. NEWTON: You cannot have the twelve gentlemen before you, and ask them questions in the open board, and there will be some questions to ask each candidate.

Mr. SAVAGE: I think it is very desirable it should go to the committee.

Mr. BIDGOOD: The committee should have instructions to send up a number, not less than eight.

Mr. SHAW: Do I understand we are bound to appoint a gas examiner?

The CHAIRMAN: Yes.

Mr. SHAW: I think it is perfectly in the discretion of the board.

Mr. RICHARDSON: There is no one to find fault with us if we do not.

The motion was then put and carried.

The following is the list of the candidates:—

A. G. Anderson, professor of chemistry, 19, Tavistock Crescent, Westbourne Park, W.
G. F. Ansell, 27, Bernard Square, Russell Square, W.C.
Martin Burgess, 8, St. Germains Road, Lewisham, S.E.
William Cook, 11, Chatham Place, Blackfriars Road.
W. T. Fewtrell, F.C.S., 14, Walbrook, E.C.
T. W. Keats, Chemical Laboratory, 7, Printing-House Square.
A. L. Muspratt, 11, Imperial Square, Cheltenham.
T. Redwood, Ph.D., 39, Russell Square, W.C.
E. Versmann, Ph.D., F.C.S., 3, Walbrook Buildings, E.C.
R. W. Walpole, 84, Buckingham Palace Road, Pimlico.
W. J. Ward, 37, Stock Orchard Crescent, Holloway.
W. Willmott, 19, Albert Road, Queen's Road, Dalston.

COURT OF COMMON COUNCIL—GUILDHALL, THURSDAY, MARCH 11.

At the Meeting of the Court this day—the Right Honourable the LORD MAYOR presiding—the election of a gas examiner for the City of London was proceeded with.

Mr. BONTEMS said his friend, Mr. Gover, had placed upon the paper of business a notice of motion respecting the proposed appointment, which, in the unavoidable absence of Mr. Gover, he had been requested to submit to the court. It was to the following effect:—"That, in addition to the duties mentioned in the report of the Gas Committee agreed to at the last court, it shall be the duty of the gas examiner to attend the Gas Committee and the Commissioners of Sewers, when required, and to advise them on any matters relating to gas; and that the election to the office take place upon those conditions."

Mr. DRESSER ROGERS seconded the motion, which was agreed to.

Mr. Heisch and Dr. Whitmore, the two selected candidates, were then introduced to the court, and invited to take their seats on the alderman's bench.

The LORD MAYOR informed the candidates of the resolution just passed, and each expressed his willingness to accept the conditions thereof.

The election was then taken, the poll being kept open for an hour. Before that period had expired,

Dr. WHITMORE rose and said: My Lord Mayor, I understand that there has been such a large majority of votes already given in favour of my honourable friend, Mr. Heisch, that I think I should best consult the convenience of your lordship and the court if I say at once that I accept the decision at present arrived at. Perhaps I may be permitted, while doing so, to express to those members of the court who have kindly interested themselves on my behalf, my sincere thanks for their kindness and for the votes they have recorded in my favour. Dr. Whitmore then retired.

At four o'clock the scrutineers reported the result of the poll to be as follows:—

For Mr. Heisch	98
„ Dr. Whitmore	46
Majority for Mr. Heisch	52

The LORD MAYOR then submitted the following resolution, which was carried—"That Charles Heisch, Esq., F.C.S., be and he is hereby appointed the gas examiner of the City of London, in accordance with the provisions of the City of London Gas Act, 1868, and the terms and conditions of the report of the Special Gas Committee agreed to on the 25th of February last, and the resolution of the court passed this day with relation to this office, and subject to the standing orders of the court, and to annual election."

Mr. HEISCH, in returning thanks for his appointment, said: My Lord Mayor and gentlemen, I hardly know how to thank you sufficiently for the honour you have this day done me in electing me as your gas examiner. All I can say is, that it shall be my endeavour to show my sense of that honour

by the manner in which I discharge the very important duties of that office. I think you will feel with me that I shall better evince my sense of obligation to you in that way than by any lengthened speech on the present occasion.

MR. NEVILLE TURNER AND THE CROYDON LOCAL BOARD.

A meeting was held at Bromley, a week ago, for the purpose of discussing the drainage question and the formation of a ratepayers protection association, to which Mr. G. Neville Turner (of Croydon) was invited by the promoters. Mr. G. Chambers occupied the chair, and said the local authorities proposed to borrow £50,000 for the drainage of Bromley, and although there could not be two opinions as to the necessity of the drainage, yet it was the opinion of the promoters of the meeting that their representatives were going to do the right thing in the wrong way. Mr. Morley, the next speaker, moved—"That this meeting, having heard that it is proposed to drain the parish of Bromley at an expenditure of £50,000, is of opinion that so large an expenditure ought not to be incurred until another London engineer of experience shall have been called in to advise the local board in the matter, and that delay is the more expedient because the whole subject of local taxation is about to be reviewed by the Legislature." Mr. Turner seconded the resolution. In doing so he condemned the proceedings of local boards in general, who, he said, were more or less under the influence and mercy of their clerks and engineers. He had attended a previous private meeting of those who promoted this movement, and, in consequence of what he said, a Mr. Jacobs had made what he termed a very ungentlemanly and slanderous attack on him in a letter which appeared in the *Tunbridge Telegraph*. This newspaper was forwarded to him, and at the same time he also received a letter from a highly respectable firm of engineers, who wrote telling him of the attack made upon him for what he had said, and telling him also they "fully endorsed the observations reported to have been made by him at the Bromley meeting." In order to give greater weight to the proof of the allegations about the nuisances caused by sewage irrigation in Croydon, he would quote from the local board reports in the Croydon papers, which would fully justify every word he had used upon the former occasion. He then quoted the various complaints against the sewage nuisance which had been made during the past few years up to the present time, and the last complaint from a resident was reported in the local board proceedings of Feb. 16, when one of the members of the board, Mr. Punnett, said that "if the board did not attend to these matters they would stink in the nostrils of the public as much as the nuisance stank in the neighbourhood." Besides the cases quoted, there were, Mr. Turner said, heaps of other complaints on record; one gentleman, without troubling himself by applications to the board, simply instructed his solicitor, and in a very little time an injunction was obtained, and the board were compelled to take their sewage in another direction, and away from the complainant's premises, at a cost to the parish of £12,000. In fact, no person could calculate the ultimate cost of drainage by irrigation. It was not a question of drainage or no drainage with the people of Bromley, for every one must desire to have the sewage and *excreta* carried away from their houses as quickly as possible; but it was a question of how to drain without crushing the town with debt, and without injury to others. As a resident in Croydon for ten years he was able to speak to facts; and as to the figures put forward as proof of what the crops realized, nothing was said as to what it cost to grow those crops, or how much of the sums said to have been obtained was real profit. The fact was that the costs were enormous, and though there were figures as proof of profitable cultivation, it was no proof at all, for the costs were not calculated. Mr. Jacob (surveyor to the Bromley Local Board) had said no complaints had been made of nuisances at Norwood by the representatives of the district at the local board; but such a statement was not consistent with facts, for on referring to the reports of the board's proceedings they would find that on the 12th of September, 1867, the subject of the great nuisance arising from the filter-beds was brought before the board by Mr. Wilson, and a great stir was made upon the subject. Then again on the 30th of July, 1868, they would find an intimation sent, for the twentieth time, from the gentlemen residing in the neighbourhood, making known their intention to institute proceedings against the board if the intolerable nuisance was not abated. They had had at one time no less than from 800 to 1000 empty houses in Croydon, and people were deterred from becoming residents on account of the heavy rates. They had the best water and the best railway service in the country, and the health was not bad, but the rates were something fearful. Those rates were more or less the result of the extensive sewage works carried out upon the irrigation principle, which had been so conducted as to entail no end of extra expenditure in order to save the board from innumerable actions for damages for the nuisances they created. Those statements were all proved by the official proceedings of the board, and he wished Mr. Jacobs to understand they were not *ex parte* statements. Mr. Turner here read several other complaints made by various parties to the board, and also gave the name of a gentleman who compelled them to take their sewage four miles away from his neighbourhood. With the knowledge of what Croydon had done, the Bromley Board would do well to pause before they threw their sewage broadcast into another parish, where they would find themselves threatened and attacked on all sides with actions for damages. Croydon and other towns had simply been spending vast sums of money without regard to the present wants of their towns, but only looking to the probable future requirements. In answer to a question, he said he believed that, notwithstanding the enormous rates and gigantic loans, they had reached their worst at Croydon, and that last year their rates were 6d. less. A regular scene ensued, after which the motion was put and carried. A memorial to the local board, asking them to defer the main drainage of the town until the question of local taxation should be dealt with, was then passed, and ordered to be presented; and a ratepayers association was formed, "to watch generally over the interests of the ratepayers of Bromley."

With regard to this statement made by Mr. Turner, and what he said at a preliminary meeting, which was reported as follows, the subject was brought before the Croydon Local Board:—

"Mr. G. Neville Turner, honorary secretary to the Croydon Ratepayers Association, attended the meeting, and furnished some valuable information as to the formation and working of the association in his own town. He also gave some startling facts in connexion with the drainage of towns and the utilization of sewage by irrigation. He most strenuously urged the township of Bromley to oppose with might and main any attempt to utilize the town drainage by irrigation, and in spite of all the glowing accounts painted by enterprising engineers in favour of irrigation, it is said, upon most undoubted authority, to be a monstrous failure; yet interested and ignorant men are urging upon an unsuspecting public this frightful contrivance. The Registrar-General says: 'I know of no circumstance more likely to predispose a population for the reception of fever and cholera than the inhalation of an atmosphere vitiated by the presence of sulphuretted hydrogen.' As Croydon has often been pointed to as a brilliant example of the success of irrigation, it may be well to state what are the actual results. The town is drained by gravitation, and the sewage discharged at the outfall is nothing more nor less than a mass of putrifying *excreta*, and it is found by ample experience to be impossible to incorporate the filth with the soil, and a great portion lies upon the surface, or clings to the vegetation. The land soon becomes saturated with matter, and diffuses malaria all around; and in Croydon the result has been to drive all the inhabitants from within a large radius of the scene of irrigation, and to bring down upon the local board innumerable actions for creating a nuisance, and thereby damaging property value. Then, as to the fabulous crops produced, let no man deceive himself as to the facts. Sewage kills all fine grasses, and will only grow Italian rye-grass, and has proved worthless, for cattle will not eat it unless pressed with hunger—and when grown with sewage it becomes perilous to their health, and also to the health of all who eat the flesh, for the taint remains. In addition to the noxious sewage gas there is also the noxious sewage weed, which those who have visited the Croydon works may have seen floating on partially putrefied sewage in minute flocculent particles, which develop and multiply themselves with exceeding rapidity, and these particles adhere to all crops grown. Take a few blades and stalks of Croydon grass, and rub the lower ends in your hands, and it will emit an exceedingly offensive odour, which no person could mistake for anything else but sewage. This Croydon grass can now find no buyers—it is comparatively worthless—and the attempt to convert this sewage weed into hay has been attended with most lamentable results, for, in spite of all precautions, putrescence has fired the stacks, and the stench arising from the *débris* is described as most abominable. Mr. Turner points to Croydon as a warning to all towns about to drain. Their irrigation is, he says, a dead failure; the man who leases the farm has given up in despair; the owner of the land is aghast at the fearful depreciation of surrounding property; the local board is attacked on all sides with actions at law, and the town is dragged down with an enormous debt that will take generations to pay off; and the ratepayers groan under a rate of 8s. in the pound. Another important point touched upon was the importance of negotiating the loan of the £50,000 for our drainage by public contract, in order to get the advantage of the whole money market, as a saving of 1 per cent. would amount to £7000 on the whole sum. In districts where the loans had been so negotiated, the money had been got for 4½ per cent., whereas in places where the matter had been done 'under the rose' as much as 6½ per cent. had been paid. Mr. Turner considered such a per centage monstrous, as parochial rates were amongst the best securities in the country, and consequently there was no risk."

Dr. CARPENTER, who brought the subject before the board, was sure that if such a statement had been made at Croydon, the person who made it would have been hissed out of the building, for such Munchausen tales would not have been listened to. The person who made the statement was said to be the representative of the Croydon Ratepayers Protection Association, but if that society still existed, the members would feel the position Mr. Turner was placing them in. He would ask if the irrigation had been a failure. It could not be, for the board were free from those actions which arose, because they had not got the irrigation system, and since they had had the system they had saved the town some thousands of pounds. Mr. Turner stated that the rye-grass grown by irrigation was not eatable by cattle, except when pressed by hunger. This was ridiculous, and he thought it was a great pity, now that meat was so high in price, to endeavour to raise a feeling against rye-grass as a food for cattle. There is no foundation for such an assertion, as physiologists declare that in vegetation all taint is dispersed. Mr. Turner also spoke of the man who rented the farm having given it up in despair. He did not know which farm he referred to, but if he meant the Norwood Irrigation Fields, the tenant, Mr. Cousins, had applied for a renewal of his lease, which expired on Lady Day, 1868, and offered an extra rent of £100 per year; but the board, knowing the value of it, had kept it for themselves. The consequence was, that the receipts of the board in the nine months from Lady Day to December were, instead of the £300 offered by Mr. Cousins, £671 19s., whilst their expenditure would have been the same if Mr. Cousins had kept the land. If, on the other hand, Mr. Turner referred to the farm held by Mr. Marriage, at Beddington, the lease had not expired, nor would it be renewed. He would ask if it was not a fact, since the establishment of the irrigation works, a whole line of buildings had been constructed in the centre of the irrigation fields at Beddington; and that at Norwood many houses had been filled which were previously empty. There had been but one complaint brought against the irrigation fields, and that complaint, after having been investigated, was declared to be groundless. As to the health of Norwood, where the irrigation fields were, Mr. Pocknell had told them that the mortality during the past year had only been 1·207; and during the past year 926 new houses had been added to the rate-books. He thought the public ought to know these facts, and that Mr. Turner's fallacies should be brought forward; and when gentlemen in Mr. Turner's position go about making such statements, he may rest assured that, if there is a reporter in the room, his words will be transmitted back to the town he is belying. It would be seen that he is a Baron Munchausen, who ought to be taken care of by his friends, and not be allowed to traverse the country unattended.

Mr. T. FARLEY, as a member of the board, said he felt much obliged to Dr. Carpenter for bringing the subject forward. Dr. Carpenter had not replied to one fallacious statement in the report—viz., that rye-grass grown on irrigated land was not capable of being converted into good hay. With good management that grass made excellent hay, and, as a proof of this, he would mention that Mr. Sigers, a tenant of the board, had got half a dozen stacks from a few acres, which were now being cut by his (Mr. Farley's) hay-binder, and selling at £5 10s. per load. He was surprised that any gentleman should get up at a public meeting and make such statements.

Mr. DRUMMOND said that great praise was due to Dr. Carpenter for bringing the matter forward; but he thought that, in comparing the person who made the statement to Baron Munchausen, the comparison was hardly a fair one, the baron's tales being harmless, whilst the other was composed of base lies, and ought to be exposed.

Several other members expressed their appreciation of Dr. Carpenter's conduct in bringing the matter before the board.

The board then adjourned.

EAST BARNET GAS AND WATER COMPANY.—The sixth half-yearly general meeting of the shareholders took place on Friday, Feb. 26, at the London Tavern, R. Wilkinson, Esq., in the chair. The directors report and statement was received and adopted, and a dividend at the rate of 6 per cent. per annum, free of income-tax, was declared, payable on Monday, March 15, at Messrs. Glyn and Co.'s, the company's bankers. It was stated the directors had arranged to purchase the water-works of the British Land Company, the joint business to be carried on, under the Act of Parliament obtained, as the "East Barnet Gas and Water Company"

DR. STEVENSON'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTH OF FEBRUARY, 1869:—

Date.	Number of Observations.	Average Light in Candles produced by 5 Ft. of Gas per Hour.	Light in Candles reduced to Consumption of 120 Grs. per Hour.	Traces of Ammonia.	Traces of Sulphuretted Hydrogen.
Feb. 1	10	13·2	13·2	Present.	None.
3	10	14·0	14·0	,,	,,
5	10	13·6	12·9	None.	,,
8	10	13·8	13·6	,,	,,
10	10	13·0	13·2	Present.	,,
12	10	13·8	14·1	,,	,,
15	10	14·8	14·5	,,	,,
17	10	14·2	14·7	,,	,,
19	10	14·2	14·5	,,	,,
22	10	13·5	14·5	,,	,,
24	10	16·3	15·4	,,	,,
26	10	15·0	15·3	None.	,,

The illuminating power of the gas ranged from 12$\frac{2}{10}$ standard sperm candles to 15$\frac{6}{10}$ candles. An illuminating power of 12 candles is required by Act of Parliament. The illuminating power on no occasion fell so low as this, and it was on an average equal to 14$\frac{7}{10}$ standard candles—*i.e.*, 18 per cent. above the statutory illuminating power. The amount of sulphur (impurity) was very slightly in excess of that allowed by Act of Parliament—viz., 20·48 grains in 100 cubic feet. Sulphuretted hydrogen was invariably absent. Ammonia was present on nine out of twelve occasions.

DR. FRANKLAND'S ANALYSIS OF THE METROPOLITAN WATERS IN FEBRUARY, 1869.—"Royal College of Chemistry, Feb. 25, 1869.—Sir,—I have the honour to submit to you in the following table the results of the chemical examination of the waters supplied to the metropolis during the month of February. For the purpose of comparison I append also the results yielded by the waters supplied to the towns of Edinburgh, Newcastle, Glasgow, Manchester, Preston, and Lancaster, when submitted to the same analytical processes. The samples of water supplied by the Southwark and Lambeth Companies were very turbid; those drawn from the mains of the Chelsea and Grand Junction Companies somewhat less turbid. The West Middlesex, New River, East London, and Kent Companies delivered water which was perfectly clear and transparent. The samples obtained from the mains of the Southwark and Lambeth Companies were entirely unfit for domestic use without previous filtration. Examined microscopically, the sediment deposited from the Southwark and Grand Junction Companies waters contained living organisms. That from the Lambeth and Chelsea Companies waters was partly composed of organized matters, which, however, exhibited no motion. In January the sediments from all the turbid waters contained living organisms. Although the West Middlesex and Southwark Companies both derive their water from the same source, the water of the latter company contained, on the 5th inst., double the amount of organic matters, as compared with that found in the former.

Companies.	Date and Place of Collection.	Temperature in Centigrade Degrees.	Total Solid Impurity.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen, as Nitrates and Nitrites.	Total combined Nitrogen.	Previous Sewage Contamination (Estimated).	Chlorine.	Total Hardness.
Thames.											
Chelsea.....	Feb. 5—Cab Rank, Horse Guards..	9·4	26·6	·475	·067	·002	·230	·299	2000	1·75	16·34
West Middlesex	Feb. 5—Cab Rank, Portland Road..	9·7	28·8	·336	·042	·001	·286	·329	2550	1·90	21·35
Southwark & Vauxhall..	Feb. 5—Cb. Rk. St. George's Ch., Bo.	10·6	27·9	·686	·079	·003	·220	·302	1910	1·70	20·73
Grand Junction.....	Feb. 5—Cab Rank, Woodstock St..	9·2	28·4	·607	·068	·004	·274	·345	2450	1·65	20·61
Lambeth....	Feb. 5—Cab Rank, Lambeth Road..	9·4	27·6	·526	·058	·003	·279	·340	2500	1·75	18·63
Other Sources											
New River...	Feb. 6—Cab Rank, Tottenham Ct. Rd.	8·6	32·0	·291	·042	·001	·387	·430	3560	1·65	24·46
East London.	Feb. 6 — Slater's, Old Ford Road .	10·0	35·9	·298	·029	·001	·450	·480	4190	2·10	26·96
Kent.....	Feb. 5 — Deptford Bdge. Police Stat.	11·7	42·6	·135	·010	·000	·391	·401	3590	2·25	32·08
Edinburgh Waters.											
Crawley Burn	Sept., 1868.		11·28	·187	·031	·001	·000	·032	0	1·042	6·1
Comiston Wr.			22·58	·085	·017	·001	·744	·762	7124	1·886	10·4
Swanston Wr.			12·70	·378	·059	·001	·000	·060	0	1·390	6·2
Colinton Wr.			14·10	·203	·042	·000	·000	·042	0	0·894	9·2
Newcastle...	September		23·40	·237	·062	·000	·000	·062	0	1·588	13·9
Loch Katrine	July, Glasgow....		3·0	·161	·011	·001	·000	·012	0	·905	0·3
Manchester..	June—Manchester		6·2	·183	·009	·006	·025	·039	0	1·117	3·7
Preston	August—Preston .		12·44	·236	·031	·006	·000	·036	0	1·590	8·9
Lancaster ...	Nov.—Lancaster..		4·58	·129	·022	·001	·000	·023	0	·993	·87
Column 1	2	3	4	5	6	7	8	9	10	11	12

The numbers in columns 4, 5, 6, 7, 8, 9, 10, 11, and 12 all relate to 100,000 parts of the waters. The table is to be read thus: The Chelsea Company's water collected on Feb. 5, at the Horse Guards cab rank, had a temperature of 9·4° Cent.; 100,000 lbs. of it contained 26·6 lbs. of solid impurity; the organic matter, constituting a portion of this impurity, contained ·475 lb. of carbon and ·067 lb. of nitrogen. This solid impurity also contained ·230 lb. of nitrogen in the form of nitrates and nitrites, besides ·002 lb. of ammonia, whilst the total amount of *combined* nitrogen in every form was ·299 lb. The above quantity of water supplied by the Chelsea Company had been, after its descent to the earth as rain, contaminated with sewage or manure matter equivalent to 2000 lbs. of average filtered London sewage. By gradual oxidation, partly in the pores of the soil, partly in the Thames and its tributaries, and partly in the reservoirs, filters, and conduits of the company, this sewage contamination had been converted into innocuous inorganic compounds before its delivery to consumers. The amount of chlorine contained in the same weight of water was 1·75 lbs. Finally, 100,000 lbs. of the Chelsea Company's water contained 18·34 lbs. of carbonate of lime, or an equivalent quantity of other soap-destroying ingredients.—I have, &c., E. FRANKLAND.—The Registrar-General, &c."

AVERAGE COMPOSITION AND QUALITY OF THE METROPOLITAN WATERS IN FEBRUARY, 1869.—The following are the returns of the Metropolitan Association of Medical Officers of Health:—

Names of Water Companies.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen.		Hardness.	
			As Nitrates, &c.	As Ammonia.	Before Boiling.	After Boiling.
Thames Water Comps.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction. . . .	20·93	0·153	0·210	0·010	14·6	3·8
West Middlesex . . .	21·57	0·107	0·244	0·001	14·9	4·1
Southwark and Vauxhall.	22·13	0·190	0·240	0·008	14·9	4·8
Chelsea	21·97	0·157	0·372	0·010	14·8	4·6
Lambeth	20·00	0·217	0·498	0·006	13·8	4·6
Other Companies.						
Kent	27·73	0·060	0·375	0·002	19·9	5·9
New River	21·77	0·060	0·225	0·001	14·9	3·8
East London.	25·40	0·123	0·336	0·002	16·0	4·6

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours; and, in the case of the metropolitan waters, the quantity of organic matter is about eight times the amount of oxygen required by it.

The Grand Junction, the Southwark and Vauxhall, the Chelsea, and the Lambeth Companies waters were turbid when drawn from the mains, but the rest were quite bright. According to the returns supplied by the companies to the association, the quantity of water supplied to the metropolis in the month of January last was 91,578,341 gallons. This is at the rate of 199 gallons per house, or 28·9 gallons per head of the population.

H. LETHEBY, M.B.

THE SEVENOAKS WATER-WORKS COMPANY.—The ordinary general meeting of the shareholders of this company was held at the Crown Hotel, on Monday. Mr. W. J. Thompson occupied the chair. The directors reported that the company continued to progress in a most satisfactory manner, and the rental had increased to £555 18s. 9d., showing an increase of over £140 beyond that of the previous year. Water had been laid on to several cottages during the year, the total number of cottages now paying weekly rent being 150. The directors recommended a dividend of 3 per cent. for the year on all the shares paid up to the 31st of December last, free of income-tax, such dividend to be paid on the 5th of April next. The balance-sheet was approved of, Messrs. E. E. Cronk and W. Pawley were re-elected directors, Mr. Easton was appointed a director in the place of Mr. Tipping, M.P., who had resigned, and Mr. J. W. Whibley was appointed auditor.

FATAL EXPLOSION OF NAPHTHA.—A fearful explosion occurred in Birmingham, on Wednesday afternoon, at the naphtha-works of Messrs. Demuth and Co., of Oldbury. It appears that the still in which the extracting process was going on exploded, and set fire to a large number of barrels, all of which were filled with naphtha. The fire thus caused could not be extinguished. All efforts made to put it out proved utterly vain. Two of the men who were employed at the works, and whose names were Ellement and Pickerill, were burnt to cinders, and four other men, named Forrester, Bastible, Rollason, and Tomlinson, were so severely injured that two of them have since died.

QUALITY OF GAS IN BRIGHTON.—The report of Mr. Edward Moore, analyst, as to the illuminating power and purity of the public gas during the month of February, was as follows:—

Hove Gas Company.

The mean of eight observations gives an average value equal to—
14·34 in standard candles.
The highest value was . . . . . 14·74 ,, ,,
The lowest . . . . . 13·75 ,, ,,
The proportion of sulphur in 100 cubic feet of gas was 21 grains.

Black Rock Company.

The mean of eight observations gives an average value equal to—
14·21 in standard candles.
The highest value was . . . . . 14·62 ,, ,,
The lowest . . . . . 13·9 ,, ,,
The proportion of sulphur in 100 cubic feet of gas was 16 grains.

The gas of both companies was found on one occasion to be a fraction below the standard of 14 candles, the average result being nearly one-third of a candle above that standard. The proportion of sulphur is moderate by comparison with previous results, and the gas was at all times free from sulphuretted hydrogen.

FATAL ACCIDENT AT A GAS-WORK.—As Mr. Harris, the manager of the Ballinasloe Gas-Works, was on Tuesday engaged with a man named Mullins in examining a large pipe, which was sunk in a sort of pit, a sudden rush of gas overpowered them, and they fell down insensible. One of the stokers immediately gave the alarm, and they were quickly removed. Medical assistance was at once procured, and Mr. Harris was restored, but Mullins expired in a short time.

NEW RIVER COMPANY.—It appears from the abstract of accounts of this company for the past year that the receipts have been—from water-rents, rents for houses, trades, watering streets, and water sold in bulk, £244,940 14s. 1d.; ground rents and rents for land, &c., £11,057 7s. 1d.; miscellaneous receipts, £5824 19s. 5d.; appropriation from money raised on bonds, &c., for new works, extensions, &c., £30,689 18s. 9d.; total, £292,512 19s. 4d. The expenditure—ordinary expenses of repair and maintaining the works and collection of revenue, £119,472 13s. 2d.; interest on money borrowed, £41,193 1s. 4d.; dividends to proprietors, £100,621 7s. 5d.; amount carried to next account, £535 18s. 8d.; purchase of lands and new works, improvements on river, pipes, pipe-laying, and other outlay, £30,689 18s. 9d. Total, £292,512 19s. 4d.

Register of New Patents.

2283.—ALFRED HOMFRAY, of Witley Lodge, Halesowen, in the co. of Worcester, gentleman, for "*Improvements in separating coal, cokes, and breezes from bats and other impurities, and in machinery or apparatus to be employed for that purpose, which improvements and machinery or apparatus may be applied to the separation of various substances.*" Patent dated July 20, 1868.

This invention relates to an improved means of separating the coal from bats. An inclined screen or platform is constructed, the surface of which is divided. The lower edge of each portion into which the screen is thus divided is situated somewhat higher than the top edge of the portion next below it. The screen is thus made to have a step-like figure. Between the bottom edge of one step and the top edge of the next below it, an open space is left of sufficient width to let the bats and other impurities fall through. The coal to be treated is put on the top of the screen, which is set at such an angle that the coal descends thereon. The pieces of coal acquire in descending such a momentum that they are carried on to the top of the second step. The bats being flat and specifically heavier than the coal, there is greater friction between them and the screen, and on reaching the edge of the first step they fall through the opening there, and are thus separated from the coal. When the bats approximate in density and size to the lumps of coal, a transverse bar is fitted to the second step, which arrests the motion of any bats that may not have fallen through the opening, and prevents them acquiring sufficient momentum to carry them over the opening at the bottom of the second step on to the third step. Any required number of steps with openings between them may be employed. The bats are afterwards washed, as well as the dirt that has fallen through the openings in the screen, in order to separate any coal that may adhere to or have fallen through with them.

2292.—ALEXANDER MELVILLE CLARK, of 53, Chancery Lane, in the co. of Middlesex, patent agent, for "*Improvements in apparatus for feeding steam-boilers and liquid or fluid reservoirs, partly applicable to pumps.*" A communication. Patent dated July 21, 1868.

This invention consists of a self-feeding apparatus. A float is employed, maintained on the surface of the water; the float is in connexion with a bell crank-lever to the stem of a valve placed within a connexion-piece of the suction-pipe. When the float descends to the lowest level the valve is opened, and water is free to pass the piston of the pump, which is kept always in action.

2295.—CHARLES WILLIAM BRADSHAW, of Stubbington, in the co. of Hants, for "*Improvements in coupling hose for steam and fire engines, gas and water pipes, hydrants, and other similar purposes.*" Provisional protection only obtained. Dated July 22, 1868.

This invention consists in the employment of a male and female socket, so arranged that a ring is introduced between the two before joining, upon which ring eccentric grooves are formed, which act upon two wedge-like pieces of metal introduced in openings formed in the female socket. By turning the ring before mentioned, the wedges are drawn in and close upon a bevel in the male socket, and thus form a secure and water-tight joint.

2300.—CHARLES FORSTER WALDO, of 13, Bread Street, Cheapside, in the City of London, merchant, for "*Raising or moving water or other fluid.*" A communication. Provisional protection only obtained. Dated July 22, 1868.

According to this invention, which consists in obtaining vacuum by the sudden condensation of steam, an instantaneous vacuum of far greater comparative proportions than usual is obtained, into which the water or fluid, almost as instantaneously, is drawn, and is then expelled therefrom, simply by the force of steam pressure directly applied, so that by the alternate application of the suction power of a vacuum caused by the condensation of steam in a vacuum-chamber, whereby such chamber is caused to be filled with water or fluid, and the direct application of the power of steam pressure to the water or fluid to expel it therefrom, the water or fluid is transferred from one elevation or place to another.

2316.—FREDERICK HORNER, of Manchester, in the co. of Lancaster, for "*Certain improvements in the manufacture of chandeliers, bedsteads, tin and iron cans, kettles, and pans, and such other domestic articles as have hitherto been made of expensive metals, such as copper and brass.*" Provisional protection only obtained. Dated July 23, 1868.

This invention relates to improvements in the manufacture of such articles as chandeliers, bedsteads, tin or iron cans, kettles, and pans, and other articles of domestic use which have been hitherto made of brass or copper, and have consequently been expensive of manufacture.

The improvements consist in the application of copper to the exterior surface of an inferior or base metal, of which it is proposed to manufacture or construct such articles. For example, a chandelier now made of brass may be made of cast iron, and a coating of copper may be applied thereto by means of electrotyping apparatus, and the surface of copper deposited may be polished; or, if required to resemble brass, the application of brass lacquer will effect the object; and by such means the production of numerous articles, of which the above are mentioned as examples, may be considerably economized, and better designs may be obtained in cast iron, or in zinc, or similar metals, than could be afforded in solid brass or copper.

2322.—JOSEPH SYKES BROMHEAD, of Victoria Road, and 32, South Grove, Peckham, in the co. of Surrey, and JOSEPH WHITMEE, of St. John's Street, Clerkenwell, in the co. of Middlesex, engineers, for "*Improvements in dry gas regulators.*" Patent dated July 23, 1868.

The large regulator, constructed according to this invention, consists of a cast-iron case and cover with flexible diaphragm, brass ring, and cap, the ring being used for the purpose of fixing the diaphragm with screws in its place. The cast-iron cover being put in its proper position and screwed on to the flange of the case, the screws pass through the flange of the cover, diaphragm, and brass ring, thus affording additional security to and preventing any injury of the diaphragm. The case and covers are constructed with flanges outside the body of the regulator (instead of inside) for the purpose of fixing the diaphragm, and thus the case is reduced both in weight and bulk, at the same time a larger surface of the diaphragm is exposed to the action of the gas, and consequently the implement is made more efficacious than those of ordinary construction. The action of the regulator is further improved by inserting a boxwood or ebony guide for the valve-rod, the wood being saturated with oil, the guide being fixed by a nut to the cast-iron cover, the valve-rod passing through a hole in the centre of the guide, thus reducing the friction and preventing corrosion of the valve-rod.

The improvements in small regulators for one or two lights consist in constructing them in such manner that the tube for holding the jet or nipple passes through the diaphragm and is fixed thereto by nuts, the tube being screwed for that purpose. At the bottom of the tube a loop is placed for suspending the valve, the opening at the bottom of the tube being free, so that the regulated gas passes direct to the burner or nipple.

The body of the regulator is constructed of brass, copper, or other suitable material, the diaphragm being fixed by a flange and screws or other convenient contrivance to the body, the whole being covered in by an oblate spheroid or other suitable shape of silvered glass (corrugated or plain) or other reflecting material. An arch is constructed over the diaphragm, through which the burner-tube passes, and also through a straight socket screwed on to the arch and fixing the glass cover, at the same time allowing the burner-tube to pass freely up to the socket.

A regulator for one or more lights is also constructed, consisting of a series of perforated discs arranged on a screwed connecting-rod, the whole being enclosed in a brass tube, through which the gas passes to the burners, the regulation being effected by arranging the discs more or less approximating to each other according to the quantity of gas required to be passed through the tube to the burners.

2323.—AUGUSTE BOCKHOLTZ, of the city of Vienna, in the empire of Austria, Inspector-General of Railways, for "*Improvements in self-acting valves by the use of compressed air.*" Patent dated July 24, 1868.

The object of these improvements is to prevent a waste of motive power, and consists in the employment of self-acting valves actuated by compressed air; the cylinder with the valves is attached to the ordinary cylinder of the engine. It is accomplished by fitting to the interior of a pump-cylinder two pistons on one rod, which works through the end covers of the same. The cylinder has two chambers in connexion with it; these chambers are furnished with outlets and safety-valves. On the up stroke of the piston the air above is compressed, and fresh air is sucked in below, which, on the down stroke, is compressed in a similar manner. This compression of the air at each stroke acts as a cushion, and serves to steady the motion of the main piston at the end of each stroke.

2328.—GEORGE SMITH, of Camberwell New Road, in the co. of Surrey, civil engineer, for "*Improvements in machinery for obtaining rotary motion, and for raising, forcing, and measuring fluids.*" Patent dated July 24, 1868.

These improvements consist chiefly in the peculiar mode of arranging the blades or plates of rotary engines so that they may work freely and yet remain steam-tight during their revolutions around their axis, in the method of hinging or jointing the plates together at the axis, and in the peculiar construction of the outer extremities of the blades, or of pieces attached to the same, to form a steam-tight bearing surface upon the surface of the cylinder. The improvements also consist, partly, in the peculiar construction of the shaft of the eccentric drum and method of attachment of the drum to the shaft, to admit the blades, and to allow the drum to adjust itself laterally on the shaft; also in the employment of loose discs or plates, which are fitted against the ends of the drum and cylinder, between the covers, for the purpose of preventing the escape of steam at those points. The invention also consists in the peculiar arrangement of ports and valves for the admission, exhaustion, and expansion of the steam, and in the means employed to equalize the wearing of the bearing surfaces of the blades, and to diminish friction, where these ports or apertures are formed through the working surface of the cylinder. The invention also consists, partly, in the peculiarity of arrangement and combinations of the various parts, whereby they are rendered self-adjusting by the pressure of the steam. The rotating blades are hinged together at the centre of the cylinder, upon a pin or rod passing through jaws formed on each blade. The blades are fitted to slide through packing-pieces, extending lengthwise across the drum. These packing-pieces are fitted to turn in circular bearings, near the periphery of the drum, and thereby allow the blades to adjust themselves as they rotate, and keep their outer surfaces properly in contact with the surface of the cylinder. The portion of the drum-shaft within the cylinder is formed with a longitudinal aperture, to receive the centre of the arms, and the portions of the shaft enclosing this aperture are fitted into grooves or keyways in the drum in such a manner that the latter is securely attached to the shaft, but is free to move endwise thereon, and adjust itself accurately to the bearing surface at the ends of the cylinder. The loose discs are fitted upon circular parts on the drum, and extend beyond each end of the cylinder, the cylinder covers being dished to receive the loose pieces, and a space being left for the steam between the same and the covers. The drum is so arranged as to run nearly in contact with the periphery of the cylinder at one point.

2349.—JAMES ALLISON HOGG, the younger, of the City of Edinburgh, gas engineer, for "*An improved lamp.*" Patent dated July 27, 1868.

The object of this invention is an improved lamp or apparatus for producing light. This apparatus is constructed as follows:—Two tubes are employed on the Bunsen lamp principle, one of which is of smaller diameter than the other, and the said smaller tube is placed within the larger tube. One tube is placed in communication with condensed gas, or air, or with both, such gas or air being compressed by a pump or other suitable apparatus for compressing or condensing air, or gas, or aëriform or gaseous fluid. This pump or apparatus may be of ordinary construction, and may be worked by hand, steam, or other power. The other tube is placed in communication with ordinary arrangements for the supply of atmospheric air or gas thereto. The gas or the air, or both, may be supplied at any determined pressure, or it or they may be condensed or compressed (before reaching the tube or tubes) in a pump or apparatus for the purpose of ordinary construction. The mixture of gas and air is passed through a perforated plate of platina or other suitable material, or a tissue of platina wire gauze, or other suitable wire gauze, by which it is divided into numerous small jets. The mixture of gas and air is obtained thus—that is to say, one of those agents is conducted through the smaller tube and discharged through the opening thereof into the larger tube, into which also the other agent is admitted. The tubes thus act as a sort of blow-pipe. The aëriform or gaseous mixture passes through the larger tube to a piece or surface of fine platina. Pierced plate, or wire gauze, or woven platina wire, or other suitable metal may be substituted for the platina. The minute jets pass through the interstices of the platina or other material and are ignited. The metal soon becomes incandescent, the supply of air being duly regulated, combustion is made perfect, flame disappears, and the platina or metal becomes a surface of intense light.

Sometimes, instead of using a mixture of gas and air, compressed or condensed gas by itself and air at the ordinary pressure are used. Sometimes the gas and air may be heated before burning, to obtain a maximum effect.

2364.—JAMES WEBSTER, of Birmingham, in the co. of Warwick, engineer, for "*Improvements in the manufacture of gas and vapour, and in applying such gas and vapour in manufacturing and refining iron and other metals, and in recovering certain products therefrom.*" Patent dated July 28, 1868.

In carrying out this invention atmospheric air is forced through or over

hydrochloric acid, for the purpose of taking up hydrochloric acid gas or vapour, for application in the manufacture or refining of iron while in a fluid or molten condition; also in causing atmospheric air in a cooled or heated state to be forced into or over hydrochloric acid, and then through naphtha or volatile spirit, for the purpose of taking up hydrogen and carbon gas or hydrogen and a portion of the carbon from the volatile spirit. The gas is then forced through, into, or over the metals while in a molten state, for the purpose of taking up sulphur, phosphorous, silica, or carbon, or other impurities which the metal may contain.

2395.—JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the co. of Middlesex, gentleman, for "*An improved flame-spreader and aërator for gas and other burners.*" A communication. Provisional protection only obtained. Dated July 30, 1868.

This improved flame-spreader consists of a thin metal plate, which may be made in the form of a yoke or horse-shoe, connected at its ends by a curved cross-piece, and having two curved flexible arms extending at opposite sides from the vertical portions of the plate, which clasp or grip the tip of the burner and retain the plate thereon. The curved or arched portion of the plate is made sharp at its inner edge, and its outer edge has a V-shaped groove formed around it. The plate when applied to the burner is brought to a position directly above the usual slit in the tip, and is so adjusted that when the gas is ignited all, or nearly all, the luminous portion of the flame will be above the upper edge of the plate. As the flame strikes the inclined sides of the plate it is spread or distended while the air passes from below the flame into the V-shaped channel, and through the latter to the centre of the flame, which is thus furnished with such a plentiful supply of oxygen as will ensure a perfect combustion and produce a flame of great brilliancy.

2398.—JOHN GWYNNE and HENRY ANDERSON GWYNNE, of the Hammersmith Iron-Works, Hammersmith, in the co. of Middlesex, engineers, for "*Improvements in the construction of and mode of employing and driving centrifugal pumps and pumping-engines, and in surface condensers to be employed in connexion therewith, parts of which improvements are applicable to other purposes.*" Patent dated July 30, 1868.

This invention consists, first, in the construction of centrifugal pumps, by making the impeller without the usual discs or side-plates. Second, in order to vary the speed between that of the engine-shaft and the centrifugal pump, the frictional wheels are formed with one square or angular-shaped groove in the one, and a corresponding projection upon the other fitting into the groove, the amount of friction between the wheels being regulated in the following manner:—

The wheel with the groove is divided into discs, one of which is provided with a boss on which a thread is cut. When in working order these discs are separated from one another a short distance, and held in that position by a metal nut. This nut is circular in form, and the periphery is cut into a ratchet-wheel. When from any cause it is required to vary the amount of friction between the wheels, the ratchet-nut holding these discs is tightened or slackened accordingly; a pawl and catch is attached to one side of the disc to prevent the ratchet increasing. For the purpose of condensing the exhaust steam of an engine, the suction or delivery pipe of the pump is made for a certain portion of its length of thin metal; this length is enclosed within a casing of greater diameter, so that an annular space or chamber is formed by closing it at each end. This annular space or chamber forms a condenser for the exhaust steam from the cylinder of the engine, which, upon being caused to pass into it, is immediately condensed by contact with the cold metallic surface, maintained cold by the circulation of the water passing through the internal pipe.

2426.—CHARLES GEOGHEGAN, of the city of Dublin, for "*Improvements in self-acting regulators, and in the cocks or taps to the same, for supplying fluids at high pressure, and preventing the bursting of cocks, pipes, or taps, or from the effects of frost.*" Patent dated Aug. 1, 1868.

The object of this invention is to admit water or other fluids into cisterns or reservoirs in buildings at high pressure, and maintain it at all times at a fixed level, so that as soon as the water is drawn off by any outlet from the reservoir it refills itself, the cock closing at the ordinary standing level in the cistern. Inside the cistern is fixed an inverted air-vessel, with an open bottom fixed below the surface of the water at standing level, having an aperture at the top, connected with an air-tube of small bore, carried down to the top of a closed vessel, having an aperture at the top and bottom only, the air-pipe being attached securely to the upper aperture, and the bottom aperture being united to a vessel in a similar manner. This vessel has an open top, in which water is allowed to stand at a fixed level until acted upon by the condensed air.

2445.—CLAUDE FRANÇOIS CONSTANT CRETIN, of Glasgow, in the co. of Lanark, N.B., for "*Improvements in lamps for burning gases or oils.*" Provisional protection only obtained. Dated Aug. 4, 1868.

According to this invention the interior of a gas-lamp is provided with a burner which communicates by a pipe leading to a gasholder or reservoir from which the gas is supplied. The air necessary for maintaining the combustion of the gas enters the air-tight gas-tube by several holes or perforations situated around and below the burner. The carbonic and other products of combustion are drawn off by means of a fan or ventilator, so that the products of combustion are discharged at the outer extremities of the vanes. In this way a partial vacuum is effected, and, consequently, fresh air descends the air-pipe, and is supplied continuously to maintain the combustion of gas.

2457.—EDMUND EDWARDS, of 22, Buckingham Street, Adelphi, in the city of Westminster, civil engineer, for "*Improvements in pumps.*" Patent dated Aug. 6, 1868.

This invention consists in making pumps with flexible rings instead of pistons or plungers, and flexible discs or plates for valves. For ordinary lift-pumps a tube is formed, the upper part of which is expanded into a cup shape, and has a flange at the top. Upon this tube another cup, having a corresponding flange, is fastened. In the upper part of the lower tube, and in a recess just below the cup, a horizontal plate perforated with holes is placed, which forms the seat of a flexible valve. A bar is fitted, having a perforation through it of sufficient length and depth to allow a disc of flexible material to be passed through it, which disc, being held down by the bar, but allowed to bend up on each side of it, forms a water-tight valve opening upwards.

2481.—JOHN BROADFOOT, of Glasgow, in the co. of Lanark, N.B., plumber and brassfounder, for "*Improvements in water-closets.*" Patent dated Aug. 8, 1868.

This apparatus comprises a main discharge-valve of a spherical form, with a cylindrical way through it, and which is held in a spherically shaped box made in two halves. The valve is made with a shell of gun-metal, in which a tube of copper is soldered, to form the way through it. The shell is cast with spindles or journals on it, and apertures in the box through which these pass are kept tight by stuffing-boxes. One of the spindles has fixed on it a curved slotted crank, arm, or lever, acted on by a pin with a roller fixed to a lever, that has the usual hand-rod attached.

2487.—DANIEL NICKOLS, of the city of Manchester, in the co. of Lancaster, engineer, for "*Improvements in cocks or taps.*" Provisional protection only obtained. Dated Aug. 8, 1868.

This invention consists in arranging and combining with the cone-plug mechanism by which it can only be slowly rotated—namely, a worm-wheel upon the axis of the plug gearing into a worm on a short shaft formed with a handle.

APPLICATIONS FOR LETTERS PATENT.

600.—JOSEPH TOWNSEND, of Glasgow, in the co. of Lanark, N.B., manufacturing chemist, for "*Improvements in extracting and in refining oils and other products from mineral and other materials containing carbon and hydrogen, and in apparatus therefor.*" Feb. 26, 1869.

604.—WILLIAM ANTHONY HERRING, of the Chertsey Foundry, Chertsey, in the co. of Surrey, ironfounder and engineer, for "*Improvements in pumps.*" Feb. 26, 1869.

651.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, in the co. of Middlesex civil engineer, for "*Improvements in the construction of water-closets.*" A communication. March 3, 1869.

661.—JOHN BERGER SPENCE, of Manchester, in the co. of Lancaster, merchant, for "*Improvements in substances used for the purification of illuminating gas, and in the recovery of a waste product arising therefrom.*" March 4, 1869.

676.—JOHN LOADER, of Upper Clifton Street, Worship Square, in the co. of Middlesex, for "*Improvements in rotary engines and pumps.*" March 6, 1869.

679.—JOHN BERGEN SPENCE, of Manchester, in the co. of Lancaster, merchant, for "*Improvements in the production of substances to be used in the purification of illuminating gas, and in the recovery of a waste product arising therefrom.*" March 6, 1869.

690.—WILLIAM ARMAND GILBEE, trading under the style of L. de Fontainemoreau, of 4, South Street, Finsbury, in the co. of Middlesex, patent agent, for "*An improved apparatus for raising water.*" A communication. March 8, 1869.

711.—JAMES JOHN SHEDLOCK, of King's Road, Camden Town, in the co. of Middlesex, engineer, for "*Improvements in wet gas-meters.*" March 9, 1869.

712.—JAMES JOHN SHEDLOCK, of King's Road, Camden Town, in the co. of Middlesex, engineer, for "*Improvements in dry gas-meters.*" March 9, 1869.

728.—THEOBALD OBACH, of Manchester, in the co. of Lancaster, engineer, for "*Improvements in fuel economizers, parts of which are applicable to joining and fixing pipes for other purposes.*" March 9, 1869.

730.—WILLIAM ROBERT LAKE, of 8, Southampton Buildings, Chancery Lane, in the co. of Middlesex, consulting engineer, for "*Improvements in devices for rendering gas-burners self-lighting.*" A communication. March 10, 1869.

749.—JAMES BATHGATE, of Edinburgh, in the co. of Mid Lothian, N.B., for "*Improvements in the construction of certain parts of gas-meters.*" March 11, 1869.

753.—JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the co. of Middlesex, gentleman, for "*Improvements in the preparation of artificial fuel, and in the manufacture of gas and coke therefrom.*" A communition. March 11, 1869.

GRANTS OF PROVISIONAL PROTECTION.

357.—JOHN PAGE, of Glasgow, in the co. of Lanark, N.B., civil engineer, for "*Improvements in pipe-joints and in cement for the same; also suitable for cementing other articles, such as building materials.*" Feb. 5, 1869.

506.—FREDERIC DELBREIL, of Versailles, France, for "*Improvements in apparatus for the removing and facilitating the utilization of excrementitious or other refuse matter which passes into the sewers or is deposited in cesspools or elsewhere in cities, towns, and other localities.*" Feb. 18, 1869.

523.—GEORGE GERARD HAIRS, of 6, Little Distaff Lane, in the City of London, for "*Improvements in burning and vaporizing combustible liquids to obtain light and heat, and in apparatus employed therein.*" Feb. 20, 1869.

528.—ARTHUR JACOB, of Bromley, in the co. of Kent, civil engineer, for "*Improvements in the ventilation of sewers.*" Feb. 20, 1869.

535.—FRANCIS GEORGE FLEURY, of 24, Merrick Square, Southwark, in the co. of Surrey, engineer, for "*Improvements in meters or apparatus for measuring water and other liquids.*" Feb. 20, 1869.

559.—JOSEPH BREEDEN, of the firm of J. and W. Breeden and Booth, of Birmingham, in the co. of Warwick, manufacturers, for "*Improvements in taps or stop-cocks.*" Feb. 23, 1869.

560.—JOSEPH JOHNSON and WILLIAM GILL, both of Unstone, in the co. of Derby, joiners, for "*Improvements in rotary engines and pumps.*" Feb. 23, 1869.

561.—BARNARD WILLIAM FAREY, of the firm of B. Donkin and Co., of Bermondsey, in the co. of Surrey, engineer, for "*Improvements in the seatings or facings of gas-valves.*" Feb. 23, 1869.

565.—SAMUEL HOLROYD, of Newton Heath, Manchester, in the co. of Lancaster, manufacturing chemist, for "*Improvements in the recovery of substances used in the purification of gas for illumination, and of waste products arising therefrom.*" Feb. 23, 1869.

571.—WILLIAM WILLIAMS, of 4, Mitford Street, Liverpool, in the co. of Lancaster, for "*Improvements in laying and joining pipes for gas, water, and other like purposes.*" Feb. 24, 1869.

575.—ROBERT MORTON, of Bridge House, Nine Elms, in the co. of Surrey, for "*Improvements in apparatus used in the manufacture of gas.*" Feb. 24, 1869.

604.—WILLIAM ANTHONY HERRING, of the Chertsey Foundry, Chertsey, in the co. of Surrey, ironfounder and engineer, for "*Improvements in pumps.*" Feb. 26, 1869.

651.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, in the co. of Middlesex, civil engineer, for "*Improvements in the construction of water-closets.*" A communication. March 3, 1869.

NOTICES TO PROCEED.

3241.—WALTER WILLIAM TONKIN, of 141, De Beauvoir Road, Kingsland, in the co. of Middlesex, engineer, for "*Improvements in the valves of engines or pumps.*" Oct. 23, 1868.

3273.—WILLIAM EDWARD GEDGE, of the firm of John Gedge and Son, of 11, Wellington Street, Strand, in the co. of Middlesex, patent agent, for "*An improved gas-burner.*" A communication. Oct. 26, 1868.

3314.—HENRY WALLWORK, of the city of Manchester, in the co. of Lancaster, ironfounder and engineer, for "*Improvements in taps or valves.*" Oct. 29, 1868.

3324.—JULIUS BRÖNNER, of Frankfort-on-the-Maine, in the kingdom of Prussia, manufacturer, for "*An improved construction and application of shades to gaslights.*" Oct. 31, 1868.

3363.—AUGUSTUS LEA BRICKNELL, of Stratford-upon-Avon, in the co. of Warwick, for "*Improvements in apparatus applicable as a rotary engine-pump and water-meter.*" Nov. 5, 1868.

3635.—WILLIAM NAYLOR, of Mildmay Park, in the co. of Middlesex, engineer, for "*Improvements in railway breaks and in apparatus connected therewith, part of which improvements is applicable to regulating the pressure of air, steam, gas, or water for various useful purposes.*" Nov. 28, 1868.

403.—JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the co. of Middlesex, gentleman, for "*Improvements in apparatus for heating and ventilating.*" A communication. Feb. 9, 1869.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

616.—WILLIAM EDWARD NEWTON, "*Improvements in the process of and apparatus for the distillation of tar and other substances.*" Feb. 28, 1866.

624.—EDWARD COTTAM, "*Improvements in hydraulic presses, partly applicable to pumps.*" March 1, 1866.

669.—THOMAS CLAYTON, "*Improvements in apparatus employed in producing illuminating gas from inflammable and volatile liquids.*" March 5, 1866.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

499.—JOHN CARNABY, "*Improvements in turning, managing, and regulating the taps and valves of gas-pipes.*" Feb. 25, 1862.

555.—JAMES SIM, "*Improvements in the construction of gas-meters.*" March 1, 1862.

571.—HENRY BOWEN, "*Improvements in gas-meters.*" March 1, 1862.

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Full particulars to S. C. F., care of the "European Mail," 44A, Cannon Street, CITY, E.C.

COKE BREEZE.

THE Directors of the Imperial Gas Company are ready to receive TENDERS from parties willing to purchase the BREEZE made at their several works—viz., at York Road, King's Cross; Great Cambridge Street, Hackney Road; and Sands End, Fulham, for One year from the 31st inst.

Forms of tender may be obtained on application to the SECRETARY, at the Office, 33, John Street, BEDFORD ROW, to whom the tenders must be sent on or before Tuesday, the 23rd inst.

The Directors will not be bound to accept the highest or any tender.

March 8, 1869.

FOR SALE, the following second- hand GAS APPARATUS:—

A Gasholder, 24 ft. diameter, 10 ft. deep, with cast-iron Tank, 25 ft. diameter.

A Gasholder, 30 ft. diameter, 12 ft. deep. All in good condition. Can be delivered and fixed complete.

A cast-iron Purifier, 6 ft. square.

A cast-iron Purifier, 8 ft. by 6 ft.

Several other Purifiers of various sizes.

A Station-Meter, capable of passing 2000 cubic feet of gas per hour.

Several Slide-Valves, perfectly sound, 6 and 8 in.

Apply to EDWARD COCKEY AND SONS, FROME.

PURIFIERS FOR SALE.

TO BE SOLD CHEAP, in excellent condition, a second-hand PURIFIER (Malam's patent), in four compartments, each 3 ft. square by 3 ft. deep, with centre-valve, 4-in. inlet and outlet, five tiers of riddles, cast-iron lids, and lifting apparatus complete.

For price and particulars, apply to Mr. W. H. CHAMBERS, LOWESTOFT.

TO CONTRACTORS AND OTHERS.
SURPLUS STOCK OF STEAM MACHINERY.

TO BE SOLD BY AUCTION, at Banbury, by Messrs. CLARKE & BARROWS, on EASTER TUESDAY, March 30, 1869, at Eleven o'clock, about 40 high-class new and second-hand PORTABLE STEAM-ENGINES, from 3 to 25 horse power. A number of very superior Thrashing Machines, Cultivating Apparatus, Saw Tables, Mortar Mills, Agricultural Implements, &c.

For catalogues of sale, apply to Messrs. BARROWS AND STEWART, Engineers, BANBURY; or the AUCTIONEERS, 38, Cannon Street, BIRMINGHAM.

THE ALFORD GAS-WORKS, LINCOLNSHIRE.

TO BE LET, for a term of years, and entered upon on the 6th of April next, the Buildings, Gasometers, Retorts, Fixtures, Apparatus, and Utensils forming, and connected with, the gas-works at Alford, in the county of Lincoln; and also the Pipes, Mains, Syphons, Lamps, Pillars, and Brackets in and under the several streets and roads of the town of Alford.

For rent, terms of letting, and further particulars, apply to Mr. CARNLEY, East Torrington, near Wragby, LINCOLNSHIRE.

March 12, 1869.

THE Directors of the Guisborough Gas Company are prepared to receive TENDERS for the erection of a GASHOLDER, and the excavation and building of a TANK for the same.

Plans and specifications are deposited at the Estate Office, Middlesborough, and may be seen between the hours of Ten a.m. and Five p.m., from Monday, the 15th inst.

Sealed tenders to be delivered to the Secretary on or before the 25th inst.

The Directors do not bind themselves to accept the lowest or any tender.

THOMAS C. CLOSE, Secretary.

Estate Office, Middlesborough, March 11, 1869.

GAS COALS AND CANNEL.

THE Directors of the Rochester, Chatham, and Strood Gaslight Company are prepared to receive TENDERS for the supply of 16,800 tons of GAS COALS and 1600 tons of CANNEL.

Particulars and forms of tender on application at the Office, 56, High Street, ROCHESTER.

Tenders must be at the Office not later than Eleven o'clock in the forenoon of Thursday, the 25th of March inst.

W. SYMS, Secretary.

March 11, 1869.

THE GASLIGHT & COKE COMPANY'S NEW WORKS, at BECKTON, near BARKING.

TENDERS FOR CLAY RETORTS, &c.

THE Directors of the Gaslight and Coke Company will be prepared to receive TENDERS, on or before Thursday, the 25th day of March inst., for the supply of CLAY RETORTS and other Fire Goods, to be delivered alongside their New Works, at Beckton, situate on Galleons Reach of the river Thames, in accordance with a specification to be obtained at this Office.—By order,

JOHN ORWELL PHILLIPS, Secretary.

Horseferry Road, Westminster, March 11, 1869.

SOUTH METROPOLITAN GAS- LIGHT AND COKE COMPANY.

NOTICE is hereby given that an ORDINARY MEETING of the PROPRIETORS of this Company will be held at the London Tavern, in the City of London, on MONDAY, the 5th day of April next, at Two o'clock precisely, to receive the Directors Report, and the Accounts of the Company for the half year ended December 31 last, to declare a Dividend, and to elect a Director in place of John Ewart, Esq., and an Auditor in place of A. F. Paull, Esq., who retire from office at this meeting, but, being eligible, offer themselves for re-election.

Any Proprietor holding 40 shares, intending to become a candidate for either of these offices, must give notice in writing at the Office of the Company, at least 14 days previously to the day of election.

By order,

THOMAS LIVESEY, Secretary.

Old Kent Road, March 12, 1869.

PHŒNIX GASLIGHT and COKE COMPANY.

NOTICE is hereby given that the adjourned HALF-YEARLY GENERAL MEETING of PROPRIETORS, holding previous to Christmas last £300 paid-up capital and upwards in the said Company, will be held, pursuant to the Act of Incorporation, on WEDNESDAY, the 7th proximo, at Twelve for One o'clock, at the Bridge House Hotel, in the Borough of Southwark, for the purpose of declaring Dividends to Christmas last, to elect Directors and Auditors for the ensuing year, and on other business.

By order of the Court of Directors,

ISAAC ADOLPHUS CROOKENDEN, Secretary.

No. 70, Bankside, London, S.E., March 5, 1869.

All the Directors retire, but seven are to be re-elected, the remaining three, likewise the Auditor, offer themselves for re-election.

The qualification is £2000 capital stock, held for more than three months, and notice 14 days prior to the Meeting.

TO BUILDERS AND GASHOLDER MAKERS.
CONTRACT FOR WORKS.

THE Phœnix Gaslight and Coke Company are prepared to receive TENDERS for the construction of a Brick TANK and Telescoped GASHOLDER, with all necessary fittings, &c., at their Kennington Lane Station.

The plans and specifications may be inspected, and further information obtained, upon application to the Engineer, at this Office.

Sealed tenders, marked "Tender for Tank," or "Tender for Gasholder," to be delivered on or before the 24th inst., at Twelve o'clock.

The Company do not bind themselves to accept the lowest or any tender.—By order,

I. A. CROOKENDEN, Secretary.

No. 70, Bankside, March 4, 1869.

THE Directors of the Rochester, Chatham, and Strood Gaslight Company desire to receive TENDERS for the erection of a GASHOLDER; 90 ft. by 25 ft., at their works, at Gillingham, Kent also for a wrought-iron Annular TANK for the same, 95 ft. by 25 ft. 6 in., with 3 ft. water space; or for a similar TANK in cast iron; according to plans and specifications, which may be seen at their Office, 56, High Street, ROCHESTER, after Thursday next, the 18th of March inst.

They will also receive tenders for the erection of such Gasholder and Tank according to plans and specifications to be furnished by the persons tendering.

The Directors will not be bound to accept any tender.

W. SYMS, Secretary.

ROSSENDALE UNION GAS COMPANY.

DRY-LIME PURIFIERS.

THE Directors of the above Company are prepared to receive TENDERS for the supply and erection of Four Dry-Lime PURIFIERS, 14 ft. square inside by 5 ft. deep, with wrought-iron lids, and fitted with 14-in. dry centre-valve and connexions.

The drawings and specification may be seen at the Chief Offices of the Company, Bacup, on application to the Engineer and Manager, Mr. NEWBIGGING, who will receive sealed tenders, endorsed "Tender for Purifiers," up to Tuesday, the 23rd inst.

The Directors do not undertake to accept the lowest or any tender.

Chief Offices, Bacup, March 11, 1869.

C. A. S. VICKARY,

(ADMINISTRATRIX TO THE LATE JOHN VICKARY,)

GAS ENGINEER AND CONTRACTOR, IRON AND BRASS FOUNDER,

EXE ISLAND, EXETER,

Tenders her best thanks to the various Gas Companies in **England, Ireland, and Wales,** for the very liberal and kind support received by her lamented husband for the last **22 years,** during which period he erected and extended more than **200 Gas-Works.** She respectfully solicits a continuation of that support, and begs reference to the following testimonial:—

Plymouth and Stonehouse Gaslight Company.

Sir,—I have much pleasure in testifying that the 100-foot Telescope Gasholder and Cast-Iron Tank, erected by you for this Company in 1862, has given the highest satisfaction, and never required the slightest alteration or adjustment since its completion.

Mr. John Vickary. (Signed) PETER ADAMS, Chairman.

The late Mr. Vickary also erected a 100-foot Gasholder and Cast-Iron Tank at **Exeter;** an 80-foot Telescope Gasholder and Iron Tank at **Devonport;** a 90-foot at **Torquay,** &c., &c. At either of these works satisfactory references can be made.

C. A. S. V. begs particular attention to her **Improved Gas-Meters,** both **Wet and Dry,** the materials and workmanship of which are guaranteed of the very best description, and which have gained for her Meters so excellent a reputation.

RETORTS, DIP & ASCENSION PIPES, HYDRAULIC MAIN, CONDENSERS, PURIFIERS, STATION-METERS, GOVERNORS, VALVES, and GASHOLDERS,

Of any size, and every description of article required in Gas-Works supplied.

Mains, Tees, Connexions, and Syphons, from 2 to 12 in., always in stock, and supplied at Scotch prices.

Clay Retorts and Fire-Goods of every description.

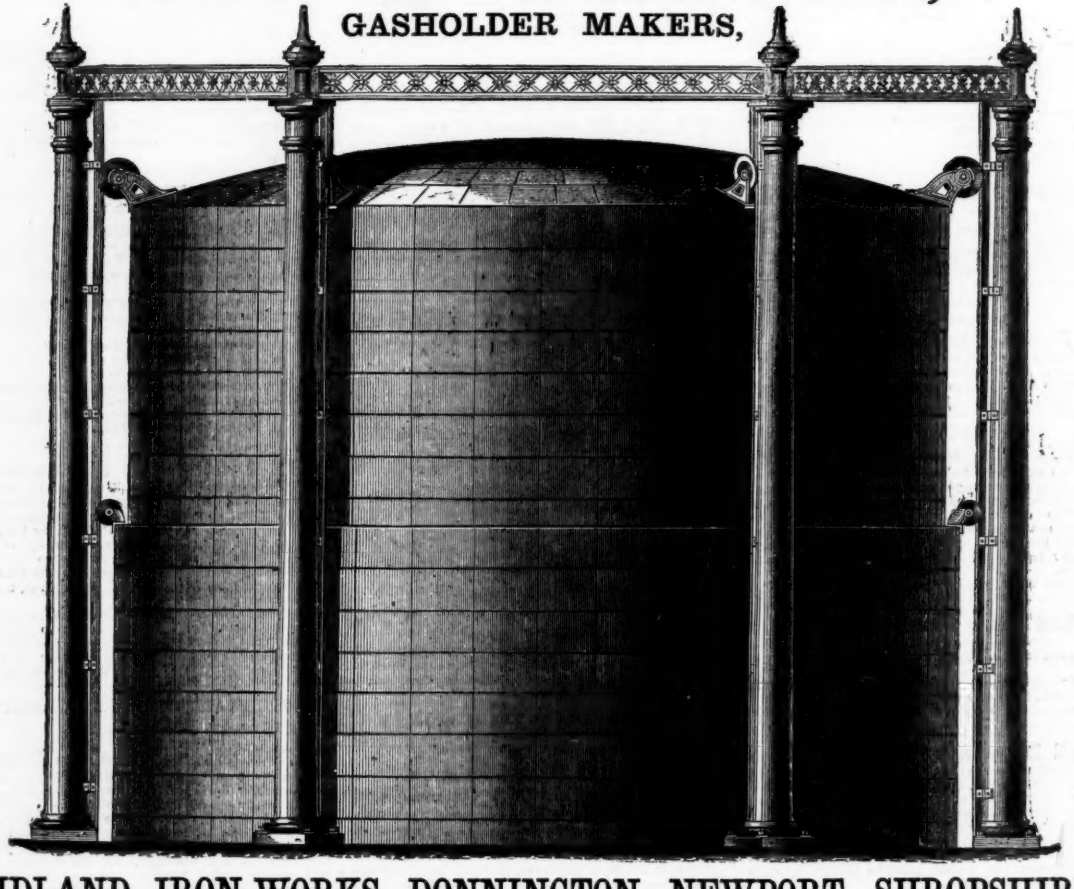
Chandeliers and Gas-Fittings of the most modern designs.

Iron Pipe and Fittings, Service Cocks, &c.

Plans, Specifications, and Estimates for the Erection of New Gas-Works of any size furnished.

C. & W. WALKER,

GASHOLDER MAKERS,



MIDLAND IRON-WORKS, DONNINGTON, NEWPORT, SHROPSHIRE.

LONDON HOUSE: 8, FINSBURY CIRCUS, LONDON, E.C.

CANTERBURY GAS & WATER COMPANY.

CONTRACT FOR GAS COALS.

THE Directors hereby invite Tenders for the supply, at per ton, during the twelve months from this date, of 5500 tons of Lanchester Pelaw, Pelaw Main, or other good GAS COALS, to be delivered at the Company's Works in about the following proportions:—

1st of May,	1869	400 tons.
,, June,	,,	400 ,,
,, July,	,,	400 ,,
,, August,	,,	400 ,,
,, September,	,,	400 ,,
,, October,	,,	450 ,,
,, November,	,,	600 ,,
,, December,	,,	700 ,,
,, January,	1870	750 ,,
,, February,	,,	550 ,,
,, March	,,	500 ,,

The weights to be ascertained and verified in such manner as the Directors may from time to time order or approve.

Each tender must state the name of the Coals offered, and a price, either at the pit's mouth, or delivered free of expense into the Company's Works.

Tenders to be sent to the Secretary's Office, on or before Thursday, the 25th of March inst., endorsed "Tender for Coals."

The Directors reserve the right to reject any tender.

By order,
JAMES BURCH, Secretary.

Canterbury, March 1, 1869.

TENDERS FOR COALS.

THE Derby Gaslight and Coke Company are desirous to receive OFFERS for the supply of 18,900 tons of SOFT COALS and SOFT COBBLES or NUTS, to be divided into Three Contracts of 6300 tons each, and to be delivered in the following monthly quantities—viz.:—

	Tons.
1869, April	300
,, May	300
,, June	300
,, July	500
,, August	500
,, September	650
,, October	650
,, November	700
,, December	700
1870, January	600
,, February	550
,, March	550
Total of each Contract	6300

The Company will undertake to receive from the party or parties contracting, the total quantity of 18,900 tons, in One, Two, or Three Contracts, as the Board may decide; but they do not bind themselves to accept the lowest or other tender or tenders, until after a satisfactory trial of the Coals and Cobbles or Nuts to which such tender or tenders may relate shall have been made. They are to be the best of their kind, and as free as possible from sulphur, bats, bind, refuse, and dirt, and shall be weighed upon a correctly adjusted machine.

Payments will be made monthly, if and so long as the contracts shall be duly fulfilled, to the extent of nine-tenths of the amount of the invoices, and the balance will be discharged on the satisfactory completion of the contract.

Sealed tenders (to be made on forms obtainable at the Company's Office), specifying the description of Coals and the pits at which they are to be raised, and stating the prices for delivery by canal at Derby at the new gas-works adjoining the Midland Railway Company's workshops, or at the canal wharf, and also the price delivered at either of the Midland Railway Stations, Derby, and in manner and subject to the conditions aforesaid, must be delivered at the Offices of the Company, Friar Gate, on or before Saturday, the 3rd day of April next.

The respective contracting parties will be required to execute an agreement to be prepared by and to the satisfaction of the Solicitor of the Company.

By order of the Directors,
ISAAC FISHER, Secretary.

Derby Gas Office, March 16, 1869.

TENDERS FOR GAS COAL.

THE Directors of the Gaslight and Coke Company will be prepared to receive TENDERS, on or before Thursday, the 25th day of March inst., for the supply of from 80,000 tons to 100,000 tons of NEWCASTLE GAS COAL, or their equivalent in Coal of a superior quality.

Particulars as to delivery, &c., to be obtained at this Office. By order,
JOHN ORWELL PHILLIPS, Secretary.

Horseferry Road, Westminster, March 11, 1869.

REPAIRS OF PUBLIC GAS-LAMPS.

THE Directors of the Imperial Gas Company are ready to receive TENDERS from parties willing to undertake the repairs of the PUBLIC LAMPS lighted by the Company for One year from the 31st inst.

Specification and forms of tender may be obtained on application to the SECRETARY, at the Office, 33, John Street, BEDFORD ROW, to whom tenders must be made on or before Tuesday, the 23rd inst.

The directors will not be bound to accept the lowest or any tender.

March 8, 1869.

THE Oldham Corporation Gas Committee is prepared to receive TENDERS for supplying WET GAS-METERS during the next twelve months.

Particulars can be obtained on application to the MANAGER.

Tenders to be sent in on or before Tuesday, March 23.

Gas Offices, Oldham, Feb. 26, 1869.

THE Directors of the Aberdare Gas Company are prepared to receive TENDERS for a New (or, provided it is in good condition, a Second-Hand) GASHOLDER, from 60 to 70 ft. diameter, and from 20 to 23 feet high, with an Iron Tank.

Tenders to be forwarded, at once, to the Company's Office, 22, Canon Street, ABERDARE.

O'NEILL'S NATURAL HYDRATED PEROXIDE OF IRON is acknowledged to be the best in the market. It contains 90 per cent. of pure Oxide, is light, permeable, and perfectly free from grit and other deleterious ingredients. Now used exclusively in several of the largest London and provincial gas-works.

JOHN WM. O'NEILL and Co., 57, Bishopsgate Street Within, LONDON, E.C.

FRASER'S PATENT RIBBED RETORTS.

The IRON RIBBED RETORTS are more durable than plain castings, and retain their original shape to the last.

The "Ribs" strengthen the FIRE-CLAY RETORTS, and by affording an increased heating surface favour the more speedy and perfect carbonization of the Coals.

These Retorts are now in use at some of the London works, and in a great number of the provincial gas-works.

For Illustrated Circular, with testimonials, &c., apply to A. C. FRASER, Gas-Works, COLCHESTER.

LINTZ COLLIERY COMPANY.

FIRE-BRICK AND RETORT WORKS.

THE LINTZ COLLIERY COMPANY
Beg most respectfully to draw the attention of
GAS COMPANIES, FURNACE BUILDERS, FIRE-BRICK DEALERS, & OTHERS,
To the superiority of their
FIRE-CLAY GOODS,
Where resistance to heat is of paramount importance, an ample guarantee of which is in the fact of their extensive use by most of the Iron Manufacturers in the North of England.

Not only is the quality of the Fire-Clay inferior to none in the northern Coal-field, but the greatest care is taken in selecting it. It is all hand picked, and well weathered before use.

All orders for
FIRE-CLAY RETORTS of any shape or size, FIRE BRICKS, &c.,
Will meet with prompt attention.
LAYCOCK'S GARESFIELD COKE.

OFFICES: LINTZ COLLIERY, BURNOPFIELD, Co. DURHAM; AND QUAYSIDE, NEWCASTLE-ON-TYNE.

TAR PURCHASED,
In Districts contiguous to the Advertisers Works.

Superior Quick-Drying Black Varnish for every description of Ironwork. Sold in barrels of about 32 gallons. Delivered free to any station in England at 1s. 2d. per gallon, cask included.

JOHN CLARKSON MAJOR,
TAR DISTILLER AND MANUFACTURING CHEMIST,
WOLVERHAMPTON.
BRANCH WORKS AT
NOTTINGHAM, CAMBRIDGE, & BRIGHTON.

FREDERICK HOPE,
Gas and Consulting Engineer,
HIGH STREET, HOUNSLOW,

Advises Gas Companies on any subject connected with the erection of gas-works and the manufacture of gas, more particularly on the following points:—REMOVAL OF NAPHTHALINE from works and mains, and preventing the deposition of the same. ECONOMY in purification, and efficacy of the same in reducing the bisulphide of carbon to a minimum. TAR FUEL on a most simple method. Plans, Specifications, and Estimates prepared on moderate terms.

THOMAS LAMBERT & SONS,
SHORT STREET, LAMBETH, LONDON,
PATENTEES OF THE
HIGH-PRESSURE EQUILIBRIUM BALL VALVES AND DIAPHRAGM BIB & STOP VALVES,
MANUFACTURE EVERY DESCRIPTION OF
GAS-JOINTS, CHANDELIERS, PENDANTS, BRACKETS, ETC.;
WROUGHT-IRON
WELDED TUBE AND FITTINGS,
BLACK AND GALVANIZED;
BRASS, COPPER, LEAD, TIN, AND COMPOSITION TUBING;
STOCKS, TAPS, AND DIES,
And Every Description of Gas-Fitters Tools;
CAST-IRON GAS-MAIN COCKS,
WITH PATENT METAL PLUGS;
GAS SLIDE AND SLUICE VALVES;
CARTER'S SAFETY GAS-VALVES;
GAS-STOVES, REGULATORS, BURNERS, &c.
Large Pattern-Book and Price List of Gas-Fittings, price 7s. 6d., supplied on application.

BELGIAN CLAY RETORTS.

J. SUGG and CO., late ALBERT KELLER, Ghent.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

Communications, addressed to J. SUGG and Co., GHENT, will receive immediate attention.

ROBERT MACLAREN and CO., EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

TWENTY YEARS PRACTICAL EXPERIENCE.

EDWIN BENTLEY,
RETORT SETTER,
29, LOWER HOPE STREET, HALIFAX,
YORKSHIRE.

Fire-Clay and Iron Retorts, Double and Single Grooved Brick Retorts, of every description.

Bentley's Improved D Brick Segment Retorts, 5 or 3 in one bed.

Testimonials and references on application.

TO GAS ENGINEERS AND FITTERS.

Every Description of
GAS LANTERNS & REFLECTOR LAMPS
For Shop Windows kept in Stock.
W. DAVIS, 17, Wells Street, Oxford Street, LONDON, W.
Established 1820.

Mr. H. GORE,
CONSULTING GAS ENGINEER,
20, ALFRED PLACE, BEDFORD SQUARE, LONDON, W.C.

B. CARPENTER'S
IMPROVED
WOOD SIEVES FOR GAS PURIFIERS.
WORKS:
14, JOHN STREET, PENTONVILLE ROAD,
LONDON, N.

The above Sieves are used by the principal Gas Companies in London and the country. Their utility, durability, and cheapness combined, render them superior to all others.

Testimonials from Gas Engineers who have tested their qualities forwarded on application.

All orders punctually attended to, and estimates given if required.

HARRIS AND PEARSON,
STOURBRIDGE.
PROPRIETORS OF
BEST GLASS-HOUSE POT & CRUCIBLE CLAY.
MANUFACTURERS OF
FIRE-BRICKS, GAS-RETORTS, AND FIRE-CLAY GOODS
OF EVERY DESCRIPTION.

Orders of any magnitude, for home and exportation, executed with all possible despatch.

N.B.—A quantity of Retorts in stock.

Circulars, 15 in. and 16 in. Ovals, 20 in. by 14 in.

D's, 15×13, 16×12, 18×14, 20×16, 21×14, 24×14.

ANDREW HARDY & SON,
RETORT SETTERS,

Beg to inform Engineers, Managers, and Gas Companies in general of their CHANGE OF RESIDENCE from Waterloo Road, Uxbridge Moor, to OLD CROWN GARDENS, UXBRIDGE, MIDDLESEX.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of Clay Retorts, Fire-Bricks, and every description of Fire-Clay Good

---

TO GAS AND WATER COMPANIES.

SECOND-HAND
FIRE AND BURGLAR PROOF
SAFES.
BEFORE PURCHASING SEND FOR
GRIFFITHS' MONTHLY LIST OF SAFES,
By Milner, Marr, Thos. Perry and Sons, Mordan, Price, Whitfield, and every eminent maker, at about half the price of new.

A guarantee given with each.

A large quantity of TANN'S SAFES from £2 10s.

Apply to GRIFFITHS, 43, CANNON STREET, E.C.

FOR SALE,

SECOND-HAND STATION-METERS AND GOVERNORS,

As under, all in excellent Working Order, equal to New, guaranteed.

STATION-METERS.

5,000 Cubic Feet per hour, 8-in. Connexions.	8,000 Cubic Feet per hour, 8-in. Connexions.
6,000 „ „ 8-in. „	12,000 „ „ 10-in. „

STATION GOVERNORS for 2, 5, 6, and 12 inch Mains.

APPLY FOR FURTHER PARTICULARS TO

GEORGE RAIT, MANAGING DIRECTOR,

GAS-METER COMPANY, 238, KINGSLAND ROAD, LONDON, N.E.

THE GAS-METER COMPANY

(LIMITED), LONDON,

(Successors to CROLL, RAIT, and CO., LONDON, and WEST and GREGSON, OLDHAM.)

MANUFACTURE

STATION-METERS & GOVERNORS

At their Oldham Establishment, which has long possessed the reputation of supplying this description of apparatus of the most perfect construction and appropriate design.

CONSUMERS GAS-METERS IN CAST-IRON & TINNED SHEET-IRON CASES.

STREET GOVERNORS, PRESSURE and EXHAUST REGISTERS, TEST GASHOLDERS,

AND EXPERIMENTAL GAS APPARATUS GENERALLY.

For information, &c., apply to

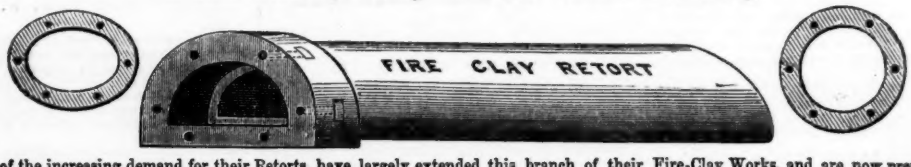
W. ARCHER, Manager, Meter Factory, OLDHAM;

OR TO

GEORGE RAIT, Managing Director, KINGSLAND ROAD, LONDON.

THE FARNLEY IRON COMPANY,

FARNLEY, near LEEDS,



In consequence of the increasing demand for their Retorts, have largely extended this branch of their Fire-Clay Works, and are now prepared to execute the most important orders, either for *home* or *export*, with great punctuality.

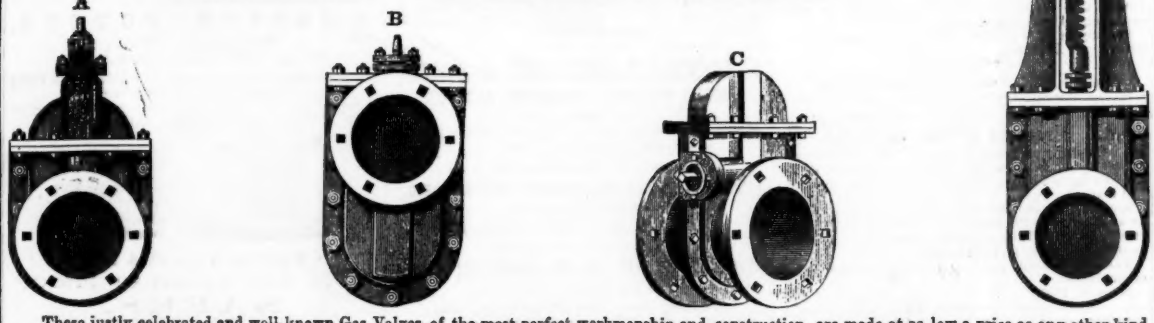
The Fire-Clay raised from the Farnley Estate (commonly called the Wortley bed) is unsurpassed by any other known in the district, and is peculiarly well adapted for Retorts, Gas-Ovens, and Fire-Bricks; and the F. I. Co. beg especially to invite those connected with Gas-Works, who have not yet used their Retorts, to be good enough to favour them with a trial.

The F. I. Co. generally hold in stock, for immediate supply, Fire-Bricks of every size and kind—Tiles, Sanitary Tubes, Ornamental Terra-Cotta Ware White Facing Bricks, the White, Buff and Salt-Glazed Bricks, &c., &c.

Prices, Drawings, and all other information may be obtained by applying as above, or to

MR. SUTTON, THE HULL STORES, 46½, QUEEN STREET, HULL.

C. & W. WALKERS' GAS-VALVES.



These justly celebrated and well-known Gas-Valves, of the most perfect workmanship and construction, are made at as low a price as any other kind. **A**—Above-ground Screw Gas-Valve, with improved indicator to show when open and shut, is the best Valve for Purifiers where the most perfect tightness is required, and for heavy pressure generally. **B**—Under-ground Screw Gas-Valve. **C**—Internal Rack Gas-Valve, with pinions of homogeneous metal. **D**—Ordinary Rack and Pinion Valve, with strong undamageable racks and pinions.

MIDLAND IRON-WORKS, DONNINGTON, NEAR NEWPORT, SHROPSHIRE,

AND 8, FINSBURY CIRCUS, LONDON, E.C.

INTERNATIONAL EXHIBITION,
1862. CLASS X.
PRIZE MEDAL
For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.
WILLIAM STEPHENSON & SONS,
THROCKLEY,
NEWCASTLE-ON-TYNE.

JAMES NEWTON & SONS,
(Established 1820,)
FIRE-BRICK AND TILE MERCHANTS,
Wholesale and for Exportation,
FALCON DOCK, 78 AND 79, BANKSIDE,
SOUTHWARK, LONDON, S.E.,
DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for
GAS AND WATER WORKS.

HANCOCK'S INDIA-RUBBER GAS-TUBING.
All sizes, from ⅛ in. to 4 in. diameter and upwards.
Also,
HORSE SINGEING APPARATUS, best make, with GAS-BURNERS, COMBS, and INDIA-RUBBER TUBING, all complete.
INDIA-RUBBER BAGS for GAS-MAINS.
WASHERS for GAS and STEAM JOINTS.
VALVES (pure solid Rubber) for STEAM-ENGINES.
PACKING (Elastic) for STEAM-ENGINES.
FLANGE TUBING, for excluding Draughts and Dust through WINDOWS, DOORS, and GLASS CASES.

Section.

Illustrated Price Lists on application.
JAMES LYNE HANCOCK,
Vulcanized India-Rubber Works,
GOSWELL MEWS, AND 266, GOSWELL ROAD LONDON, E.C.

Established 1811.
READY & SON,
BILSTON STREET BRASS FOUNDRY,
WOLVERHAMPTON,
MANUFACTURERS OF
SUN BURNERS, GAS CHANDELIERS, HALL LANTERNS, BRACKETS, PENDANTS,
And every Description of
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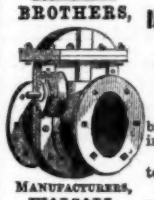

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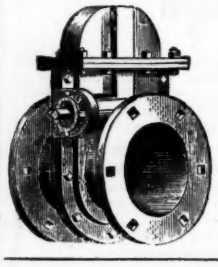

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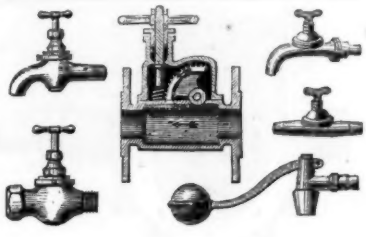

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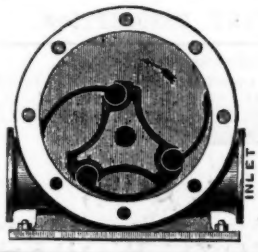

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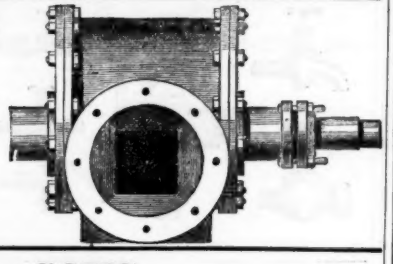

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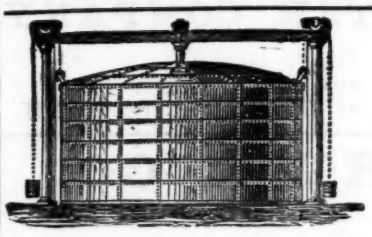

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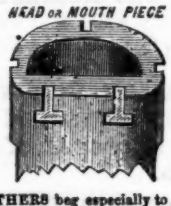

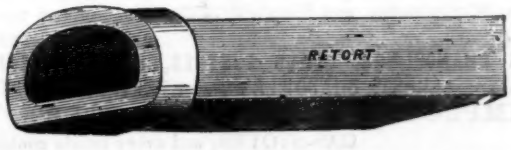

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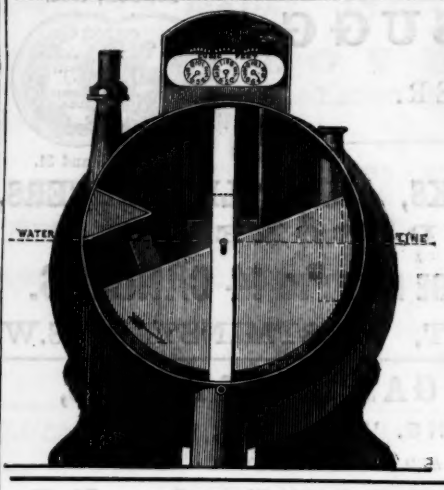

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